HULL OF A HOME

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2020

Fig.1: Rauha (middle boat) moored at Mölandet Island near Vuosaari, Finland.

HULLOFAHOME:
vessel as refuge and experience

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Master's Thesis
Contemporary Design Program
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Spring 2020

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A sailboat is a place for escape and refuge. When at sea, the hull relies only on buoyancy, the sails on catching wind and the sailor is left in silence, besides the rippling water. Any route is possible amidst coastline and on board there are minimal necessities. My research begins by asking: How can we learn from sailors by creating opportunities for environmental meditation, a shared intimate environment, and preservation of material? I search in my thesis to encapsulate this feeling of freedom of movement, simplicity of experience, and comfort of a personal enclosure to create an experimental spatial structure with possibilities for solitude or social engagement.

Collaborative mobile space, like a sailboat, allows one to have agency to control one's atmosphere and to utilize potential space. The constraints set for the project are motivated by my research of how aspects of sailing experience and culture can be emulated—a stand-alone structure that is easy to carry and assemble, creates an enclosure via translucent textile, and is large enough to accommodate company. Through several spatial iterations, the final prototype structure is comprised of bamboo segments and a spinnaker sail. The structure can be folded to travel and the sail can return intact to its original use.

This space-making practice offers a new perspective on material reuse and encourages a proactive approach to infiltrate initially designed and accepted spaces and products. In an age of ecological catastrophe and comfortable standards of living, pragmatic ingenuity needs to be activated and inspired by examples of designerly methods. I explore methods of crafting value in everyday material with a focus on retaining imbedded meaning. I consider how this awareness of material history and potential can effect the quality of daily lived experience.

Surrounded by consumerist excess, I feel an obligation to evaluate my real needs and what I can do to extend the lifespan of material possessions as an investment in precious materials. How can I influence the mindset of users to empower their amateur designerly skills to think of future potential of reuse, reinvention, or rebirth to create solutions rather than buying them?

This work represents a process of searching for relevant insights into the sailing phenomenon, the effect of space, and feelings of comfort as associated with identity and home. My personal narrative is included in this research as autoethnographic research, including my fascinations, experiences, and motivations, which influence and lead the design process.

keywords: *design theory, autoethnography, associative design, spatial experience, materiality, adhocism, sailing*

Acknowledgements

Advisors:
Julia Lohmann
Gianluca Giabardo
Anna-Marie van der Lei

Supervisor:
Maarit Mäkelä

Aalto University Arts Scholarship
Aalto University workshop masters & faculty
Mehta Heino Industries
Contender Sailcloth
Doyle Sails
WB Sails

Sailors:
Jyrki Lyytikkä, Tuuli Viskari, Linda Barton Saza, Brian Porter,
Anders Skogman, and Matti Christersson.

Friends & family—especially Adrian Rigopulos, Johno McPartlan, and M.I.N.E.

Fig.2: Brewster, Cape Cod, Massachusetts at low tide. Left, two people on the horizon.

1

I n t r o

I grew up on Cape Cod, in the northeast of the United States between a bay and the Atlantic Ocean. Living by water taught me what possibility, openness, and mobility are meant to feel like. I learned how to sail on a pond when I was young, and was immediately enamored with the simplicity of the vessel and the first feeling of freedom and control. I felt a brave independence, the worst thing that could happen was that we would capsize and go swimming. Sailing was one way to have power over my environment. As a kid, it is natural to create clandestine environments, a hideaway, a fort, a secret personal space. As an adult, I still crave this kind of private space that is separated from reality, distractions, and outside stimuli. I have moved constantly further from home and have sought a space that can move with me and foster a sense of familiarity that I had been craving.

Helsinki feels familiar because it is near the coast. Before it rains, there is a sea-salty weight in the air. I have always enjoyed spying on the sea, to either stare at the waves and ripples, watch its progress of freezing or its melting back together again. The sea is always reflecting the weather and determining the slow migration of boats from marina slip to winter shelter. There is a perfect stillness in the calm or tumultuousness in wind and waves.

In the fall of 2017, my partner bought a wooden folkboat named "Rauha", Finnish for Peace. He also learned how to sail when he was young and developed a fascination for the unique mobility of boats on open waterways. In typical Finnish fashion, the transaction began in a sauna, as one had a sailboat to sell and one did not know he needed one. My partner immediately joined a club for people who mark time in their lives as either sailing or planning to sail.

Fig.3: Rauha in winter under boat shelter in Vuosaari, Finland.

1.1

T e l l - T a l e s

Tell-tales (sometimes referred to as tell-tails) are short strings on the sail that show the direction of the wind as it interacts with the sail. In the writing of this thesis, they are also a metaphorical device for the guiding nature of my narrative and its significance throughout the process of creating this thesis.

Wooden boats have shown me a prime example of the preservation of material; boats are viewed as things of wonder that show signs of caring hands. Their well-being is monitored carefully by the community and their decay is a reflection of neglect or abuse. Material and labor matter, they invite connection and care with the user indefinitely. The owner must quite literally be conscious of conserving the wood of the structure, as to not peel it away with old layers of paint. A relationship of obligation are made between owner and sail, wood, ropes and hardware.

The first time I saw Rauha, it was freezing and under a tarp shelter out of the water. I was enamored with what signs of life had been left behind: a cabinet storage space with three perfect circular spots for dishes, a drawer of random tools, a bilge-bar of rum and whiskey, and the identity number of the boat 170 carved into the cabin. This was when I started to wonder about the bare necessities and devices of sailing and how this environment inspires a simplicity in clever things.

Rauha took its maiden voyage (under new ownership) in the spring, with my mother on her first sailboat experience, after also living surrounded by water for so many years. That spring, we were invited on a trip in Greece with fellow Helsinki sailors. We leapt at the chance of imitating a life at sea. That first summer and the subsequent sailing trip in Greece were marked by a sense of adventure in discovering lesser-seen places, creating opportunities for seemingly well-earned meals and making conversation under sparse circumstances. Reality was suspended, the present was impossibly simple and indulgent, and we only worried about getting to shore before sunset.

I first became fixated on adapting some aspect of sailing culture into products for the home in terms of dining, storing, or fixing. I wanted to bring some of the romantic and essentialist qualities of sailing into our domestic everyday lives, such as through specificity of function and quality workmanship. On the trip in Greece, I intended to look for these clever aspects of small living space, of multi-functional furniture, and objects which could be translated to the domestic sphere. Especially in urban areas, domestic space is limited but can be better utilized by employing transformable and movable furniture to extend functional possibilities. The following is my response to the immersive sailing experience in Greece in which I try to consider what exactly I am drawn to about the experience, as the interior and devices of the boat serve as less inspiring in modern synthetic materials.

Fig.4: Keeling off the coast of Lefkada, Greece.

1.2

P o s t - G r e e c e

Sailing is so much about perspective, as one sees the world go by in 360 degrees. The French for sailboat is "bateau á voile", "voile" meaning veil. That is all that is really needed to push the vessel through the water—a cloth. There is a sense of floating on the world. Traversing the sea as transportation feels like cheating and at the same time, the most logical mode. Once buoyant and wind-catching, there is only to steer, moor, discover. The hull is a fleeting refuge from weather, for rest, for food, and for light.

All sailors talk about this special moment after they have left the harbor, pulled up the sails, and finally turned off the motor. They are left in near silence except for the wake of the water and I think this is what most sailors fall in love with. Of course they always want to go a bit faster and a bit further, but I think they also want to share this phenomenon. This literal flow feeling of them, the boat, some rope, sails, and winds—a near symbiotic relationship, if we could give something to a non-living thing.

Boats are spoken of in terms of life and legacy—their history and owners are remembered. In sailing circles, there is more pride in owning something more simple—such as a wooden boat—which also requires more manual work. The structure is traditional and basic and if the owner honors its needs, they will be happy together.

In this response, I am trying to consolidate my notions of sailing with some of the more surprising realities of short-term cruising on a yacht in the Mediterranean. In my sailboat dreams, they are wooden and receptive to change and adjustments, as well as compact and smart in design. The boat we used in Greece had a large, comfortable, plastic and fiber-glass interior that could be described as a floating mini hotel. Different corners were occupied in the evening for sleep which otherwise served as storage.

Fig.5–6: Fishing boats in Greece.

As a renter, being on-board momentarily, I did not find any connection to the interior of the boat, except for the phantom feeling I was left with of swaying and floating. The markers of time between sailing and floating were music played, whatever meal could be whipped up out of the tiny shifting galley, and eventually dark which signaled rest. I realized what was appealing to me about my partner's wooden boat were the very visible signs of a longer passage of time through suggestions of labor—of rotted wood that had been replaced, of make-shift devices and latches, of peeled and layered varnish. The plastic yacht was bright and clean and could be hosed out when we were done, but was fixed in its molded interior and stagnant in its interior functional possibilities. It served only as a vessel and shelter and lacked any unique atmospheric qualities.

Instead, I was drawn to the boats of local fishermen which were lined with old mismatching floral rugs, had collected old containers accommodated for other uses, and hosted small collections of found trinkets from the sea as decoration. These personalizations gave signs of practical use and tailored adjustments. My literary research began with Gaston Bachelard's *The Poetics of Space*, in which he examines how one connects to their lived environment through personal experience and poetry. Bachelard writes, "we can sense how a human being can devote himself to things and make them his own by perfecting their beauty. A little more beautiful and we have something quite different" (1994, p. 69). This making of something "quite different" is describing positive habits of personal investment with space and possessions and exercising feelings of gratitude.

Fig.7: Our sleeping quarters in the fiber-glass boat cabin in Greece.

Fig.8: Masts at night in Greece.

1.3

About Folkboats

The folkboat was the impetus for this project. The following is a brief history of the boat to give insight to its special design considerations and provide context for the sailing aspect of the *Hull of a Home* concept. A quote that highlights the feeling of a boat hull is a phrase of poetry from Gaston Puel from *The Poetics of Space*:

> This morning I shall tell the simple happiness,
> of a man stretched out in the hollow of a boat.
> The oblong shell of a skiff has closed over him.
> He is sleeping. An almond. The boat, like a bed,
> espouses sleep. (Bachelard, 1994, p. 124)

While I put great emphasis on my own sailing experiences, I rely on *The Folkboat Story* by Dieter Loibner to briefly describe the history of the folkboat and why it serves as inspiration for the onset of this project. Loibner describes the design challenge for the folkboat and the need within the market, "Somewhere in-between sleek racing yachts and sturdy, hand hewn utility boats was the sweet spot for a boat that performed well, handled the rigors of the ocean, yet still carried a modest price tag" (2008, p. 10). He describes a change in sailing culture from high end of yachts of the elite to accessibility to the "middle class, which had discretionary income to spend on leisure activities" (Loibner, 2008, p. 10). The materials were well considered to be affordable, the construction basic enough to be upgraded as fit, and the design to be well suited to cruising or racing. Loibner also points out in regards to design context, "in the 1940s, it helps to understand that frugality and the art of living smal—was and to a certain degree still is—innate in European cultures, which lack the expansive spaces and bigger-is-better mentality so common in North America" (2008, p. 11).

Several critics describe the folkboat as "honest" and Loibner himself notes, "a satisfying sailing experience is a subtle sensation, and can't be measured in knots and degrees (....) The true strengths become evident as soon as she casts her lines off, harnesses a fresh breeze and pokes her stout nose through some chop" (2008, p. 21). The folkboat became the image of Everyman's boat as accessible, practical and collaboratively designed by a team of people with the same goal. At the time the new design was conceived as a bit awkward and new, but now is seen as a classic representation of wooden boat design and Scandinavian sailing ideals.

The folkboat influenced the way in which materials were considered for my project by thinking of how they emit specific atmospheric qualities. Böhme describes this importance by stating:

> Thus, the aesthetic qualities of materials cannot be linked immediately to their objective properties, nor to those established through sensuous-practical dealings. Rather, these qualities consist in their *character*, that is, in the specific mode in which they are atmospherically experienced or, respectively, contribute to an atmosphere. (2017, p. 62)

This sentiment of material character informed my material choices to consist of those like a sailboat: wood, metal, and textile.

Fig.9: Upside down wooden boat hull in Greece.

Fig.10: Rauha cabin bed made in the bow.

1.4

Nomadic Mobility – Open Waters

Sailing became apparent as a place for meditation. The term "forest bathing" is a contemporary term, not having to do with hygiene, but with the act of soaking in the sensorial surroundings of the forest. This term, also known as *shinrin-yoku*, was coined in the 1980's in Japan to combat "tech-boom burnout and to inspire residents to reconnect with and protect the country's forests" (Fitzgerald, 2019, para. 1). One could in turn call sailing "sea bathing", as being in a forest and at sea both allow one to disconnect from the modern prevalence of desk-scapes and digital screens and to instead be consumed by the natural quiet of the environment. It is something that people choose to indulge in now, to find a release in the expanse of nature and its demand of nothing. In *An Account of My Hut* Chōmei questions, "Wherever one may live, whatever work one may do, is it possible even for a moment to find a haven for the body or peace for the mind?" (1955, p. 205). He continues to describe finding peace in solitude and in finally abandoning the world to live as a hermit. Finding a place of our own and escaping the norm are essential habits of our personal well-being and resetting our outlook, whether from a techno-social ever-presence and constant inundation of media or the regular routines and expectations of daily life.

Sailing on its own has a fantastical aspect to it, as absurdly off-the-grid, travel at the mercy of weather, and extreme leisure in the most mundane and immediately domestic sense. Anthropologist Claude Lévi-Strauss described a journey via boat: "It was the opposite of 'travel', in that the ship seemed to us not so much a means of transport as a place of residence—a home, in fact, before which Nature put on a new show every morning" (Relph, 2008, p. 29). The nature of the small, restrictive space and ease of mobility creates comfort in an immediately familiar tiny space and the interest of slowly shifting horizons. In this sense, the boat becomes a metaphor for the advantages of personal, mobile space which can indulge the user both in the nothingness of surroundings and the curiosity included in freedom of movement.

I became interested in the transient personal space as a spatial-furniture type, residing somewhere between object and atmosphere. Inundated with visual and sonic spam daily, what if we could utilize a familiar enclosure to combat the stress of small-living, open floor plans, and strange places. The *Hull of a Home* project began with thinking of new personal spaces that would be mobile, employable anywhere and serve as a framing device to bring focus to sensorial experience.

1.5

Interview Gatherings

After experiencing sailing as a tourist in Greece, I sought legitimate sailors akin to the Greek fishermen who owned their boats and could offer a more authentic, long-term account of the relationship of sailor/dweller and vessel. My interviewees were varied to discover how different subjects invest in the space of their boat, their spectrum of needs, and the ways in which they have tinkered or mended their home-at-sea. The specific details of their sailing lifestyles and what drew them to sailing informed my ideas of sailing phenomenon and connections to broader aspects of material and spatial design of a small enclosure. Below I summarize our exchanges to highlight what was most insightful to me in terms of sensory and personal experiences in boats.

Jyrki built his own wooden sailboat named “Kuikka”, which means loon in Finnish. He was a valuable case study as someone who tailor-made his boat to his needs and values. For instance, Kuikka was intended for day cruising around Helsinki, leaving space in the cabin just for sitting but not for sleeping or cooking. He also decided to use a single sculling oar at the stern for moving the boat versus always using a motor. On his boat I was able to find these kinds of bespoke decisions where he chose to use manual devices or hand-make pieces, including leather details and a self-made anchor. His sailboat emanates a sense of self-learning, care, and therefore a sincere attachment to the space and function of the boat as having been entirely considered. Speaking with Jyrki especially inspired me to learn by doing with my own project and to consider the benefits of the user as maker to be able to tailor-make every aspect of something to their needs and standards. The result is usually a high level of craftsmanship, personalization, and pride in a physical accomplishment as well as knowledge gained.

Fig.11: Detail of the mast of Jyrki’s boat Kuikka with handmade leather detailing.

Fig.12: Detail of handmade window curtains in Tuuli's boat Uhuru.

When I interviewed my next case study, Tuuli, on her boat in Helsinki, I was most interested in the moments of intervention or mending as signs of personal investment. Her boat, "Uhuru", Swahili for peace, has handmade curtains, mended cushions and a baby seat that attaches at one point on the cabin door, allowing a swinging sensation at sea. Later, I will explore the related concepts of autodidactism, or self-teaching, and how this relates to adhocism, an informal practice of arranging and making things as needed. Both of these concepts played a key role in the overall concept of my project and the connection of sailing as influencing and inspiring my design process.

I interviewed Linda, an expat who has been sailing for decades in Fukuoka, Japan. She described rescuing a boat which had sunk, leaving only the top of the mast visible. It had been abandoned and oysters grew on the sides, blocking the drainage holes, causing it to sink after a typhoon. She describes rescuing the boat and reviving it back to working condition with pride, sharing the other sailors' sense of attachment to their boats via labor.

Anders and I had a conversation while he was on a client's boat in Sardinia. He is a Finnish sailor who first remembers sailing by using a towel on a dinghy to catch wind. He began his professional sailing career by delivering boats trans-Atlantic, and now he no longer keeps an on-land residence. Now, he captains a yacht and said he needs, for instance, to maintain the boat from fall rains which bring sand to the Mediterranean from the Sahara Desert onto the deck of the boat. By his avid landscape photography hobby, Anders is a sailor totally immersed in life at sea and the changing coast lines. He still takes pleasure in maintaining the boat and living a quiet life.

A friend from high school, Brian, is a sailor who I interviewed with an entirely different experience of sailing. He studied boat building and only sailed for the first time after he had built a sailboat. Later, as a sailor on a super maxi racing yacht, called "Comanche" after a nomadic Native American tribe, the most interesting aspects of his experience had to do with the specific parameters of this hyper-performance, sport-based sailing. Comanche is on the opposite spectrum from a boat like Jyrki's—minimalist, light-weight and high-tech. He described all of the beds or bunks as sling-like hammocks with a sleeping bag which you could pull a string to adjust the angle when the heel of the boat was extreme. The most overwhelming aspect of being inside the carbon-fiber hull long-term was that the boat acted like a drum against the waves. Brian revealed a different facet of sailing in its racing culture—enduring an intense sensorial environment motivated by speed.

From these initial accounts from sailors, I started to realize what a sailboat really offers and what is required. Brian's experience of sailing as a sport and Jyrki's experience of daily cruising offered truly different situations of what modern sailing can be, but from both I gleaned that the interiors, the accessories, the equipment, the extra comforts, did not matter at all in the over-all experience of sailing, but the thrill of freedom, of traveling, leisurely or speedy, in open waters is what counts. One of my favorite details from meeting Jyrki, was a quote he shared from Finnish actor Lasse Pöysti, who said he is always sailing in his mind, when asked how much he invests per day in sailing every year. This romantic idea has stuck with me, of always having the feeling of an experience remotely with you which is refreshed each time, but always harbored. Pöysti articulates an idea between nostalgia and daydreaming in his mind where he can transport himself to reimagine the feeling of sailing. Memory, especially influenced by tactile materials, has the power to render experiences as fresh and present even from a distance. After doing these initial interviews, my ideas about what is most important about the vessel changed and focused on the essential nature of sailing and the sailor's sense of self-reliance and ingenuity.

I began to consider what was most important in my concept—how can one live like a sailor? How can I distill this sense of freedom and mobility while remaining close to what is essential and necessary? I embarked first on researching those subjects closest to my concept of spatial experience, nomadic notions of homing, future object typologies, and material values. Following this discussion of research, as happened chronologically in my design process, I try to digest and to translate these most important ideas into a physical form of experience which comes close to phenomenology of sailing, place-making, and the role of materials.

Fig.13: Mended rope on the sailboat in Greece.

1.6

Questions & Aims

From my first-hand research of sailing and my ethnographic research through personal interviews, I formed the questions which would drive the literary research and aims of the project. Since my interest shifted within the topic of sailing culture, I felt a need to redefine my focus and intentions. I was starting to grasp at something not entirely visual or physical and only by asking questions was I able to understand my goals for the project. I first asked:

What is so special about sailing? What can be learned from this type of mobile space?

I focused on exploring the positive effects of solitude and privacy as well as community and conversation and how these could be embodied or encouraged in a mobile space. I distilled this enclosure of the hull and the inclusiveness of the sailing community in these aspects. By comparing living in a compact sailboat versus small apartment living as variable domestic benchmarks, as a designer I wondered:

How does space affect our experience? How can phenomena become translated into the design process?

How could certain abstract elements be reconfigured to create a distilled experience? My aim became to focus on how a physical space could project a certain feeling by means of form and materials. When thinking about my romanticism with wooden boats, it became clear I was enamored with their importance as objects and possessions. The attachments to these boats is built by the history, story and signs of their survival. As a product designer and maker working in the midst of contemporary disposable culture it is essential to think:

How can object attachment be improved via repurposing and/or building to discourage excessive consumerism?

2

SpaceAsVessel, VesselAsSpace

While the physical and material form of the thesis remained unclear, I understood that I wanted to make a space inspired by a space. The interwoven literary research that follows highlights terms, topics, and ideas that framed the decision making process of the prototype structure. The following excerpt highlights potential functions and significance of space—how it can be a vessel, container, framing device, or opportunity:

> If it is a human thing to do to put something you want, because it's useful, edible, or beautiful, into a bag, or a basket, or a bit of rolled bark or leaf, or a net woven of your own hair, or what have you, and then take it home with you, home being another, larger kind of pouch or bag, a container for people, and then later on you take it out and eat it or share it or store it up for winter in a soldier container or put it in the medicine bundle or the shrine or the museum, the holy place, the area that contains what is sacred, and then next day you probably do much the same again—if to do that is human, if that's what it takes, then I am a human being after all. (LeGuin, 1996, p. 151–152)

Research for this thesis introduced me to Ursula K. Le Guin's The Carrier Bag Theory of Fiction, who postulates the very kernel of what is essentially human, and thus touches upon what this research is most basically driving at: Who am I as a designer? Why does what I make matter? What do I care about? I told my mom when I was young I wanted to grow up and make pretty things, but maybe now I am more concerned with inspiring pretty ideas, or idealistic futures. From this research, I have come to feel more strongly that specific things and materials do not matter in terms of their "prettiness," but in terms of their ability to inspire the beholder, user or onlooker to imagine life beyond themselves and their comfortable means of routine. What I value most are these tiny bits of rock from distant places, pieces of writing from loved ones, and fleeting images of photos, which I have collected as reminders of stories, people, and experiences. These are kept in the vessel of my home and saved for when I am hungry for the indulgence of nostalgia.

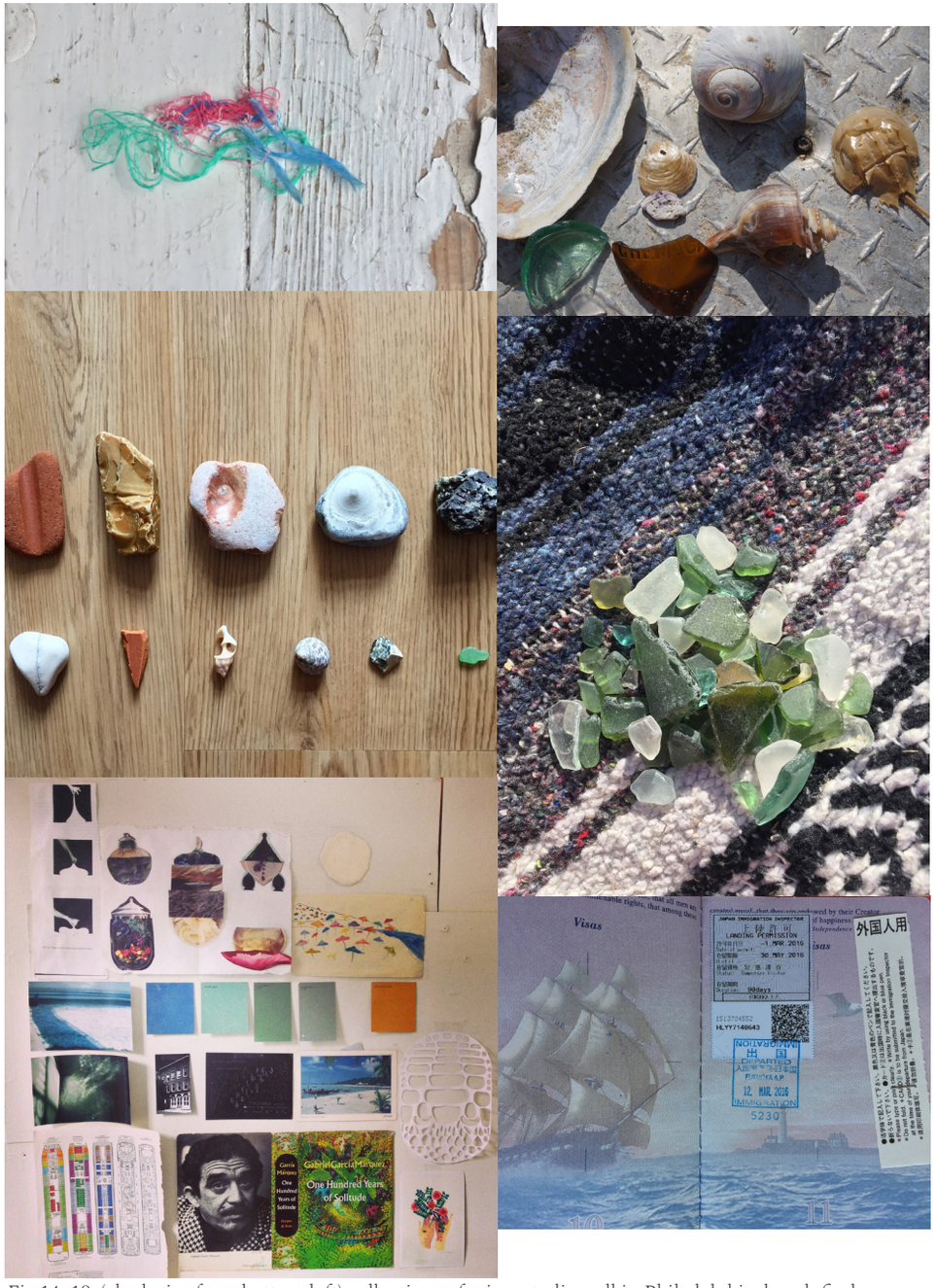


Fig.14–19: (clockwise from bottom left) collections of mine: studio wall in Philadelphia; beach finds from Greece; nylon net scraps from beaches in Greece; beach finds from Cape Cod; sea glass from Eira in Helsinki; one of my passport pages.

2.1

Place-Making in Space

Besides the material character of the boat, the essential quality of it being a space and containing an atmosphere lies in it being most abstractly a container of volume—it is a vessel. In Loibner's historical account of folkboats, he describes sailing as a means "that afforded its practitioners escape from the constraints of land-based discrimination" (2008, p. 10). This sense of finding place in the placelessness of open water and the reliance on the vessel of the boat has led to my interest in place-making, especially where it is concerned with nomadism and mobility. I began to wonder what makes a sense of place. Experiencing an enclosure of a certain atmosphere which fosters a sense of identity is necessary to feel comfortable and at home in a place. In *Place and Placelessness* Relph extrapolates:

> The essence of place lies (...) in the experience of an 'inside' that is distinct from an 'outside'; more than anything else this is what sets places apart in space and defines a particular system of physical features, activities and meanings. To be inside a place is to belong to it and to identify with it, and the more profoundly inside you are the stronger is this identity with the place. (2008, p. 49)

Important in this sense of comfort, and identity with a place often relies on a sense of privacy. The stress here is privacy as a means of freedom, as Bachelard says, "But in the daydream itself, the recollection of moments of confined, simple, shut-in space are experiences of heartwarming space, of a space that does not seek to become extended, but would like above all still to be possessed" (1994, p. 10). The folkboat exists as a home away from home, a transportable place in which to take refuge and enjoy solitude.

2.2

Concepts, Definitions & Distinctions

A large part of the thesis process was taking the opportunity to learn how to incorporate literary research into practice-based making to engage in a more holistic design process. By actively pursuing related literature to my concept, I was able to question and challenge my ideating and prototyping from a different perspective. I relied on inspiration from writers' whose ideas and philosophies supported and pushed my concept.

Relying on my first-hand research and acquired knowledge, I came to the realization that it was not personally important to make objects in relation to sailing. It became necessary to carve out a space between interrelated areas of design which could give my project context within the field. I became especially inspired by what I would like to call "outsider-design," or design which is not within the realm of manufacturing, trends, luxury aesthetics, or preordained archetypes. It is my obligation to myself and the work to give significance to my choices and insight to those interested in similar topics.

Fig.20: A Welsh fisherman carrying a *coracle* boat with paddle.

Fig.21: Mourning hats, featured in Ethel Howard's book *Japanese Memories.*

Fig.22: *One Man Tent* by Mella Jaarsma "portrays the refugee as a harassed being," Agim Meta says at *Design4Disaster.*

2.2.1

Associative Design, Fictional Design & Phenomenology

The prototypes within the scope of this project are not products based in a pragmatic reality, but are rational in the sense that they consist of familiar functional elements. The created spaces combine relatable ideas of childhood indulgences, romantic novelty, and respond to the psychological challenges of contemporary people. The *Hull of a Home* project lies within the realm of critical design practice; I have questioned normal motivations for making design objects for market by utilizing existing materials and an open design mentality. The results are closest to associative design and near towards design fiction. Matt Malpass, a lecturer in Critical Design at Central St. Martin's College of Arts and Design, explains:

> In associative design, designers employ a straightforward attitude to materials, an inventive approach to fabrication processes and methods, and typically a resistance to product styling. Methods of cut-up, context transfer and hybridity (...) are used to intervene in concepts and behaviors engaged in use. (2013, p. 338)

Malpass cites "designer-maker traditions" and experimentations in conceptual art of assemblage, collage, and bricolage as the beginnings of associative design. These methods particularly reinvent and recontextualize familiar objects to inspire a deeper conversation about design practice and material culture (2013, p. 336–7).

The contemporary practice of associative design has its roots in historical fiction and social anthropology, as in Daniel Defoe's Robinson Crusoe and Claude Lévi-Strauss's The Savage Mind respectively (Rossi, 2013, p. 74–76). In Catharine Rossi's "Bricolage, Hybridity, and Circularity: Crafting Production Strategies in Critical and Conceptual Design," she cites the writings of Defoe and Lévi-Strauss as laying the inspiration for critical design methods based in sustainability and resourcefulness. Defoe's literary classic Robinson Crusoe chronicles an island cast-away left to build a world from what is found and scavenged. Lévi-Strauss identifies, as explained by Rossi:

> Two systems of thought—the "scientific" and the "mythical"(....) He explained that, while the former seeks to go beyond the boundaries of surrounding limitations, the latter remains within them, using only what is available at hand, remixing the preexisting into new sociocultural configurations. (2013, p. 74–75)

Here Rossi relates the anthropological writing of Lévi-Strauss to a design perspective, describing how he identifies different peoples' world-views and relates this "mythical" system of thought to the crafty sense of the bricoleur or handman, using what is available at hand (Rossi, 2013, p. 75).

I was not familiar with the concept of associative design within critical design, but serves to place my project most closely in context to the design field as reusing materials, working with familiar object types and creating meaning by their combination and implementation. Researching design fiction helped me to better place my work in terms of a spectrum between product and installation to think about creating a spatial situation as a projection of other space.

Design fiction works in a similar sense to associative design to give new meaning to normative situations by proposing new imaginary musings on regular activities. Both can be seen as tools of reimagine our normal lives and objects. As Björn Franke recounts of design fiction projects:

> They blur the boundaries between the actual and the possible and can create a space for negotiating the imaginary. Design objects are particularly useful for this negotiation, since they immediately relate to the actual world and are understood in terms of use. They relate to the comedies and tragedies of everyday life. (2010, p. 89)

The structures strive to bridge the gap between what we can find feasible and what is indulgently sentimental as a means of starting a larger conversation about user agency and our emotional connections to objects.

Both associative design and design fiction rely on our aesthetic associations with objects and materials and our cultural know-how in navigating everyday life, relating to our phenomenological instincts. Karen A. Franck states in Sensory Design, "When embodiment—acceptance of our sensory, feeling selves—is embraced, sensory stimulation, movement, and activities can all become sources of design ideas" (Malnar and Vodvarka, 2004, p. 31). This expresses how the sensorial elements of the sailing experience and boat interior have manifested themselves in my project. Phenomenology is defined by Paul B. Armstrong as "a philosophy of experience. For phenomenology the ultimate source of all meaning and value is the lived experience of human beings" (2005, para. 1). *Hull of a Home* is intertwined with this phenomenology of sailing via the mobility, enclosure and materials of the created space.

In the same way that phenomenology allows us to utilize and describe our specific consciousness of experience, associative design and design fiction serve as venues and context to follow these personal insights to a point of curiosity and fruition. "How an object or event functions as a work explains how, through certain modes of reference, what so functions may contribute to a version of—and to the making of—a world" (Goodman, 1978, p. 70). These works rely on certain methods of world-making which suggest

a possible other world using familiar materials and devices, rather than a near future solution or utopian idealism, as Franke describes "value fiction" as another way to think about design fiction, "which aims to investigate alternative uses of products and technology" (2010, p. 80). By reimagining our value system of objects, we can, for instance, imagine a hypothetically altered course of history in which different people came into power, different laws were mandated or somehow other morals permeated through society.

Björn Franke also compares "fictional design as poetic design" which can be thought of as "a form of philosophical inquiry" (2010, p. 80–81). Instead of beginning with a brief, problem or a material, I have searched for an abstract means of imbuing a form with a feeling. The design prototypes of the thesis meld value fiction of using the found and widely attainable, the in-between of a spatio-furniture or personal-architecture type, and the poetic and phenomenological aspects of sailing.

Fig.23: Photograph by Frank Bayh & Staff Rosenberger Ochs from the series titled *The development of new urban quarters in the heart of the city* in reference to protestors' shelters outside of the construction site of Stuttgart 21 train station in Germany in 2012.

Fig.24–25: Boats covered for winter in Lauttasaari, Finland.

2.3

Reuse, Refuse, Refuge

The following section discusses how we construct our own worlds, why it is important that we do, and why material efficiency matters.

Within design, it is imperative to use materials which will last, can be mended, or reused. In Antti Pirinen's doctoral research titled *Dwelling as Product* he evaluates how architecture could accommodate different needs and concludes in one finding, "that possibility to personalise one's dwelling regardless of tenure increases its user value" (2014, p. 317). We also know this value of user attachment to be true with building a product, as what is now known as "The Ikea Effect". Taking part in the building or personalizing of our environment increases our attachment and therefore our feelings of comfort and identity as linked with a place. In Lefebvre's *Critique of Everyday Life*, he highlights his ideas of the agency of man:

> Thus the "world" is man's mirror because man makes it: it is the task of his practical, everyday life to do so. But it is not his "mirror" in a passive way. In this his work man perceives and becomes conscious of his own self. If what he makes comes from him, he in turn comes from what he makes; it is made by him, but it is in these works and by these works that he has made himself. (1991, p. 163)

Part of new user behavior relies on a conscientiousness of materials and introducing new ways of reuse within consumer products to gain a higher value of connection with the user and to employ an agency of use and creativity.

Fig.26: Detail of parachute in the artwork *Star* by Kris Lemsalu at Kiasma in Helsinki in 2016.

Fig.27: Construction site from *Better Than Sculpture* instagram account by Jason Lee Starin.

Fig.28–29: Shelters for animals made from found materials by shopkeepers in Istanbul, Turkey. Photographs by Nur Horsanalı for her book *Halletmek*.

My project was significantly inspired by the research and ideas of fellow classmate Nur Horsanalı in her bachelor's thesis book *Halletmek*. It highlights something bubbling up in modern culture, an affection for a serendipitous, post-production sense of design of reusing what is available. A ceramic-sculptor colleague, Jason Lee Starin, from Philadelphia started a social media account called *Better Than Sculpture*. The collection of images are found accidental compositions on the street akin to those tinkerings of materials that Horsanalı documents from Istanbul. These separate situations draw attention to our attraction to things that have a subversive kind of aesthetic not concerned with being perfect or precisely considered. There is a growing distaste for the object devoid of the human action which could have been fabricated straight from virtual rendering. Lewis Mumford, an American writer especially known for his study of cities and urban architecture, similarly says in regard to man and his surroundings, "Man is not just an actor and a fabricator: he is an interpreter and a transformer" (1975, p. 185). Inundated by the digital, signs of intervention and improvisation become more intriguing and relatable.

Horsanalı describes: "[The] Turkish word '*halletmek*', which is commonly used in daily life can refer to solving, dealing with, figuring out, handle, take care of, makeshift or to bodge" (2017, p. 3). It is most similar to the concept of Do It Yourself (DIY) or tinkering in the United States, *jugaad* in India, hacking or bricolage. These methods are each defined by a frugal sense of ingenuity with what materials are available. In her research, Horsanalı notes the difference between *halletmek* and design as, "materials are the limiting factors of 'halletmek' and the determinative factor of the outcomes" versus determining which material and form is ideally suited and created for a specific solution (2017, p. 239).

As a result of Horsanalı's influence, I delved into the idea of adhocism, as explained by Charles Jencks and Nathan Silver in their book, that this ready-made sensibility of designing and remaking something for an intended purpose can be considered as a design method and viewed within the realm of low-brow design. Jencks explains:

> Born from the conjunction of ad hoc, meaning "for this particular purpose," and ism, shorthand for a movement in the arts, the combination thrives in many places. Adhocism denotes a principle of action having speed or economy and purpose or utility, and it prospers like most hybrids on the edge of respectability. (2013, p. vii)

The idea of the ready-made within art and design has been controversial since Duchamp's *Fountain*, which lacks a certain control over materials and therefore disregard to craftsmanship in a traditional sense of objects. But I argue that these kinds of controversial compositions or arrangements serve a greater purpose to our understanding of material and object values by questioning them.

Franke describes in his writings on design fiction, "Design objects are used as catalysts for, or as gateways into the alternative world by showing, for example, uncommon uses or by embodying alien values" (2010, p. 86). Nontraditional object creations outside of the consumerist norm are subversive to our capitalist object culture, and therefore make up a design fictitious world of their own when viewed from a particular perspective. One could argue that this is exploiting a normal tendency of people who invent based on necessity, but what becomes interesting and useful as a resource is how it has turned into a reflection of the western world imposing their disposable material choices on peoples' everyday lives and how they choose to find make-shift value in that overwhelming heap of what is seemingly waste. As Horsanalı touches upon in her thesis, these tendencies within a culture can create a common know-how, new archetypal language and texture of a city, such as in Istanbul (2017, p. 249). This is a new kind of design-craft in my mind as being a trend in contemporary material culture, but the tendency of resourcefully making and fixing is not new. In *Hole & Corner* magazine's recent "Material Issue", William Asprey says in an interview, "To say that craft is a trend is nonsense, because this creativity—this craft—is something we've always had" (Hooper, 2017, p. 142). By having access to cheap disposable products, it becomes easier to buy something as a solution rather than fixing, creating, or mending something. Our time has become more valuable than material.

Fig.30: Utensil made and used while cooking on an island in Helsinki mid-sailing trip 2019. Object and photograph by Mikko Aspinen.

This combination of crafting, designing and re-evaluating materials as an example from *Halletmek*, shows us how new personal associations give depth to daily experiences and one's view of possessions' value and function. David Pye, former professor of furniture design at the Royal College of Art and writer on craft and design, brings insight to this versatile, design-craft, creative way of making and not of inventing from new, but making new associations between the familiar:

> A poet invents new juxtapositions of words and phrases which convey new thoughts. The inventor makes new juxtapositions of things which give new results. Neither the poet's words nor the inventor's things have any remarkable properties on their own. They are everyday words and things. It is the juxtaposition of them which is new. (1967, p. 64)

This quote from *The Nature of Design* highlights our continued curiosity which the inventor and poet can bring to our attention, of connecting disparate mundane things to change the way we view the world. Spatial arrangement and a different point of view can function in a similar way, to bring light to those details which we have missed. Creating a space offers a unique opportunity to bring attention through small openings, framing only a portion of the outside, or how surroundings filter through a translucent layer, revealing shadows and silhouettes. Bachelard also describes how just handling something with attention can give a new curiosity to the familiar:

> For consciousness rejuvenates everything, giving a quality of beginning to the most everyday actions. It even dominates memory. How wonderful it is to really become once more the inventor of a mechanical action! (....) He creates a new object; he increases the object's human dignity; he registers this object officially as a member of the human household. (1994, p. 67)

This is what a refuge offers: a means of experiencing consciousness and awareness. This awareness is usually linked with nature and a refreshed perspective of the finite and fragile nature of life and resources. Economy of material has been the focus of the spatial experiment in its construction, its use, and its future.

Fig.31: Mushrooms growing in a moist Rauha cabin.

Fig.32: Tool drawer in the cabin of Rauha.

2.3.1

Fuller, Otto, Isaacs: on Structure & Economy

My structural research was inspired by design pioneers who were progressively aware of ecological issues, potential habits and natures of living and embraced collaborative working practices, such as Buckminster Fuller, Frei Otto and Ken Isaacs. Fuller said in an interview with Pawley:

> A bird picking up twigs to make a nest turns the whole action into a complement of its life. A spider makes a web, a mole makes a tunnel. They alter their environment in preferred ways. Human beings do that too. They are not unusual in that, only the extent to which they do it. (1990, p. 24)

Each of these pioneers was actively questioning standard archetypes of designing and engineering the space which surrounds us, how space can influence our activities and the use of economy of materials. Fuller is most famous for the geodesic dome utilizing efficient geometric structures, Otto for his tensile structures which revolutionized the potential of textiles in architecture, and Isaacs for rethinking furniture and spatial typology to create hybrid living structures. Each focused on modular systems of building to be implemented in new expressive ways for the potential lives of people.

Frei Otto's visual research informed my methods of form-finding and prototyping within a structure, as he often used hand-made scaled prototypes to begin working on a design. Buckminster Fuller served as inspiration to think of the economy of materials and the importance of thinking of new modular systems of building that could be applied to a larger scale. The work and philosophy of Ken Isaacs led me to think more of the role of user and how their role could influence their future activities. In an interview he explains how "building something changes the individual who does it", which in turn might be better than the actual project (Snodgrass, 2015, para. 44). Isaacs also describes at the time that, "The changes indicated that the mythic significance of the status symbol might eventually give way to the conception of the object as a useful tool with which to achieve a personal experiential result" (Snodgrass, 2015, para. 12).

Fig.33: Ken Isaacs using his design *Beach Matrix* in 1967.

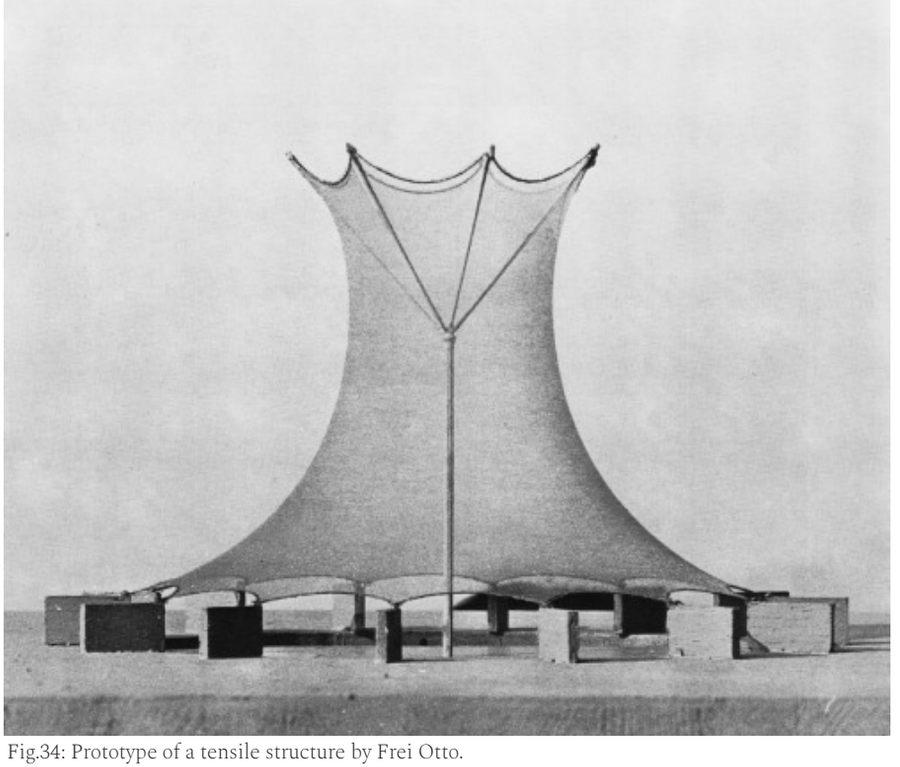


Fig.34: Prototype of a tensile structure by Frei Otto.

Fig.35: DIY sail repair.

Fig.36: Company *Nature Travels* advertises "Timber Rafting on Klarälven" in Norway and Sweden for an authentic adventure that fulfills boyhood dreams.

2.3.2

Autodidactism & Adhocism – Learn Yourself, Do it Yourself

All three designers, Otto, Fuller, and Isaacs, were mid-twentieth century contemporaries challenging our established methods and means of creating space. At the same time, in line with Isaacs philosophies of the agency of the user, Stewart Brand released a how-to guide for a new DIY, autodidactic, countercultural breed of people trying to live with a certain intention. In the first *Whole Earth Catalogue* Brand stated, "A realm of intimate, personal power is developing—power of the individual to conduct his own education, find his own inspiration, shape his own environment, and share his adventure with whoever is interested" (Wiener, 2018, para. 2). The publication could be seen as the first means of open design, of sharing instructions, insights and methods of interacting with the devices and materials of daily life. As we can see now via the Internet, free sharing and exchanging of information creates community and can empower people with information outside of existing models of education and institutions.

Also published around the same time as the *Whole Earth Catalogue* was Jencks and Silver's book *Adhocism*, mentioned previously in reference to *Halletmek*. Their philosophy behind adhocism supported the active intervention of the user in their environment and to support methods of design outside of the normal standards by using available materials. Jencks states:

> Men need to manipulate and form their local environment to sustain their identity and sanity. Again, the evidence supports the idea that an environment should allow for active, individual participation in its building. What this last point partly means in visual terms is that the environment should preserve a record of past action, so that present and future actions may become intelligible. (2013, p. 23)

Their ideas hark back to the preservation of history and record of environment intrinsic in things while engaging in new methods of use. Jencks and Silver write from a scene of social change and fluctuating values in the U.S., in the midst of the Civil Rights Movement, the Vietnam War and an atmosphere of Postmodernism, but which still "remains equally subversive and sustainable, as much a manifesto of its time as a guide for the present" (Haldane, 2013, para. 3; Wiener, 2018, para. 2).

These ideas of sustainability, individual agency and methods of daily improvisation still feel newly applicable and relevant within our

consumerist culture and the digital age as we reconsider the value of things and of globalization. My former professor of art and design history from my bachelor's studies at Alfred University, Ezra Shales, was the first person to challenge my early ideas of art, craft and design, how they intermingle and how they rely on a greater context and perspective. He instilled an idea in me that people make things and highlights that further importance in his book *The Shape of Craft* explaining, "Human-made or repaired things—intimate possessions or architecture, clothing or vehicles, stuff of any type—are necessary ways in which to extend our reach and pass on human sentience" (Shales, 2018, p. 246). Shales highlights the importance of things as they connect us to other people, through signs of life in making, history, or use in terms of objects or space. Things which are made of a quality to last or which can be reused can hold more value to us by carrying a depth of personal experience and time. Jasmin Weinert reviews Lefebvres *The Production of Space* to note, "he reaches the conclusion that real social change can only be brought about if the space we live in allows us the freedom to create, appropriate and play with. Power over space is power over life" (2015, Space and power section, para. 9). Having a freedom of space as well as objects and materials of personal value therefore contribute to a sense of satisfaction of power and well-being.

Fig.37: Detail of interviewee Tuuli's mended sailboat cushion.

2.3.3

A g e n c y o f U s e r

"Guin supposed 'story is our only boat for sailing the river of time', but so is well-spent meaningful labour, even banal maintenance like the scraping and patching of the hull of an actual wooden boat" (Shales, 2018, p. 244). So traces of activities which can be shared, appreciated and repeated are essential to filling our time purposefully, whether through labor or story. But both require a decision for action and engagement with people or materials, or both.

I found the sailing community to be like my dad: stubborn, autodidactic and full of hyperbole, but these things together serve for hard work, pride in craftsmanship and good conversation. I admire these qualities of commitment which people show to their possessions, or in this case their vessels. Incorporating the agency of the user in the co-creation or maintenance of an object, necessarily creates an attachment between builder and thing. Henry David Thoreau draws a parallel in *Walden* philosophizing:

> There is some of the same fitness in a man's building his own house that there is in a bird's building its own nest. Who knows but if men constructed their dwellings with their own hands, and provided food for themselves and families simply and honestly enough, the poetic faculty would be universally developed, as birds universally sing when they are so engaged?" (1960, p. 36)

Of course, you could argue that our incessant talking is just the same as the singing of birds, but less melodic as our method of communication. But he is trying to share in a romantic sense the satisfaction of being self-reliant and capable. By designing an accessible prototype which is user constructed, I wished to inspire this sort of proactivism with materials. In *The Nature of Design*, Pye says, "We, like our ancestors, can only design if we are capable of making reasonable preliminary assumptions based on experience" (1967, p. 25). When we have more experiences of creating through our products, we can gain a better perspective of things and their potential value.

Fig.38-42: (clockwise from bottom) Glass jars packaged with hay from the Nuutajärvi Glass Museum; cat behind curtain; flowers in plastic bottles; construction site in Helsinki; car with sun cover.

3

P r o c e s s

The process of continuously redefining my project was a result of negotiating my initial inspiration of sailing, broad theoretical research, and material trials for the structure. I quote from Shales' book to remember the importance of community and craft sensibilities in my process:

> A broad craft consciousness that begins with the tools and issues at hand reveals that we need to recover how we have worked together in the past, not merely as individuals. Our future depends on our learning collaborative crafts that flow with, not against, our environment as conditions change and as we do, too. (2018, p. 251)

My prototypes have each been crafted in a sense, made by hand through trial and error. The final structure is a simple system of bamboo covered by a sail; it is a hybrid of a tent, lean-to, off-season boat shelter, awning, cocoon, yurt, igloo, and hut. The hull-tent is a mobile space so we can keep wandering.

I relied on my advisors and peers throughout the process to navigate new materials, structural solutions and spatial experience as an amateur within each realm. I took a leap from designing objects utilized by people to create a space people could utilize; I wanted to work in a larger scale which could create experience rather than the smaller material interaction of a thing. What began as a utilitarian spatial device, transformed into an experimental process of creating spatial atmosphere while instilling accessible design principles like user agency and the significance of materiality in practice through adhocism. By utilizing different spatial types and mixing new and found materials, the user may gain a different perspective of what is possible with the means they already possess. Goodman describes this nature of perspective in *Ways of Worldmaking*:

> An object may symbolize different things at different times, and nothing at other times. An inert or purely utilitarian object may come to function as art, and a work of art may come to function as an inert or purely utilitarian object. Perhaps, rather than art being long and life short, both are transient. (1978, p. 70)

Adhocism puts this idea of transience to practice by questioning and repurposing the ordinary. What was a sail can be a tent and what was a tent can be sail; leaving material futures open to change and transformation gives unexpected meaning to what is available.

3.1

H u l l - C a b i n e t

I first focused on my own need for personal space and privacy in my creative practice to design a transportable work space. The essential idea was that I would be able to bring my materials anywhere with me in this box and feel comfortable and at home in my "hull". The design resembled a cabinet, which would open on each side to create a desk and support a textile canopy. The hull-cabinet was influenced by Ken Isaac's *Super Chair* and other living structures as well as by Andrea Zittel's *Living Units*, which both sought new multi-functional furniture systems for the way we actually live in small spaces.

For this project, I employed my father, a lifelong carpenter by trade, to interpret my design to be as lightweight as possible and guide me in the construction. In the end, the design would pass the test by being checked onto an airplane from the U.S. to Finland.

The hull-cabinet was a success in certain aspects—it was desk-sized, could accommodate two people on each side to work in tandem, the canopy could be stowed inside the cabinet space, the doors could lock shut for transportation and it had wheels to facilitate movement. But in the end it was a large static box. It did not make sense as an easily transportable device, the fabrication from all new materials made it expensive and would require specialized tools to build. It did not bear the same essentialist feeling as sailing; it felt encumbered by volume, weight and the one-thingness of its specificity.

The element that was the most simple and surprisingly appealing was the canopy. I chose nylon ripstop in white which had the effect of creating privacy and translucence to illuminate the inside of the space. The arc-shaped opening framed a focal point of nature otherwise overlooked. I took photos of my father modeling at the desk and through the opening the tropic foliage of Florida is transformed from an apartment lot barrier to a composition for speculation.

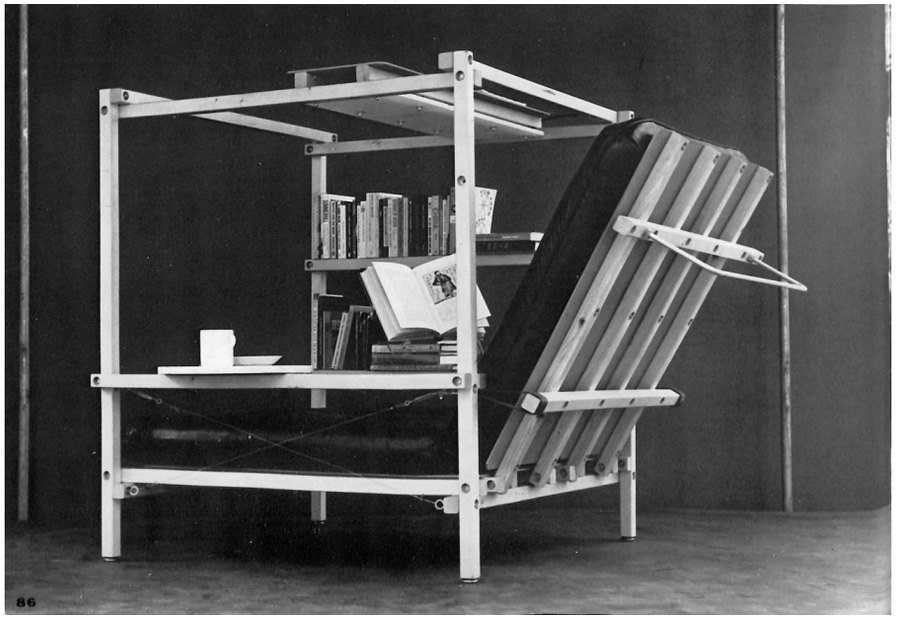


Fig.43: Ken Isaac's *Superchair*, 1967.

Fig.44: *A–Z 1994 Living Unit* by Andrea Zittell.

Fig.45–48: My father modeling the Hull-Cabinet in Bonita Springs, Florida; breakdown storage pictured.

3.1.1

Commitment to Ideas in Full Scale

This textile framing quite literally became the new focus of the material concept for my project. The canopy, the last element of this hull-cabinet, became the most significant to me only after the whole construction was complete. I began to consider how I could make a more minimal structure to support a textile as the means of making an enclosed space. Utilizing a skeletal structure covered with a membrane or veil would give the possibility of a more lightweight personal spatial device. For ease of use, I thought the structure should be modular and flexible to standalone and be brought anywhere easily. For restrictions, the pieces would need to be less than two meters (the height of a large person), use a connector between segments, and flexible yet strong enough to support the weight of fabric. Cline describes the importance of working with and experiencing space in full scale while making her hut:

> The hut's first challenge, then, involved scale: the scale of objects and persons in relationship to openings and enclosure. Abstractly conceived, scale is a risky business. The tea men before me knew this, and so designed and built their huts as a process of trial, error, and rebuilding until the result *felt* firm, at rest, grounded in space. Firmness of structure or of sufficient stoutness turns out to be no trick at all when compared with the *impression* of firmness that results only from scale. (1997, p. 29)

Only by prototyping in scale could I fully realize the effects of materials, such as atmospherically, in terms of their weight, tension and strength.

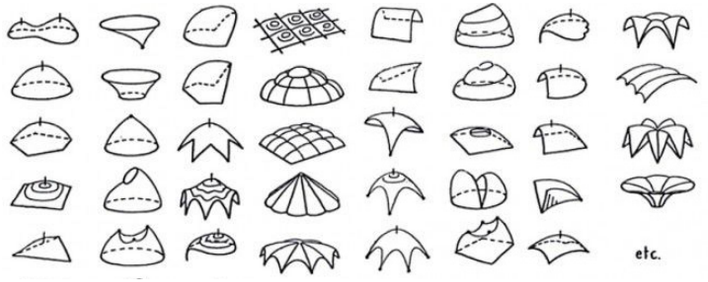


Fig.49: Heinz Isler's sketches of structures.

3.2

Prototyping & Play

I am not an engineer, a scientist or an architect, but my process became focused on finding a building system for a structure to support textile. After the hull-cabinet, I took direct inspiration from the rounded canopy and the connection to the curved interior of a boat. This rounded inside space became an essential element for the nest or cocoon feeling I was emulating that feels more enveloping or cradling than a typical box of a space. I started working between models of hypothetical structures, utilizing 3D printing for making unique joints and material searching for something with ideal flexibility and tension to make a rounded space.

I referred to drawings of Frei Otto and Heinz Isler, known for tensile structures and concrete arched forms respectively. Each used methods of small-scale prototyping with textile which gave me clues about tension, compression and their necessary balance for stability. From these architectural and highly technical examples of structure, I supplemented my visual inspiration with images of textile. The strong, curved architectural structures imitated the wooden hull of the boat while the textile images referred to the transparency or softness of the sail.

Fig.50: Rauha's bilge.

Fig.51: Christo and Jeanne-Claud's *Big Air Package* deflated, 2013.

Fig.52: Slack sail of a maxi yacht, photograph by Kurt Arrigo 2007.

3.2.1

Sketching for the Unknown

The method I used for form-finding with different materials took on an autodidact nature and fluctuated between looking at examples, sketching, model-making, and committing whole-heartedly to an execution, after which the cycle would repeat. The most challenging part of the model-making process was guessing as to the exact nature of the material when bent, put under tension and connected by flexible joints. I asked one of my professors how I could know the limits of the material and he responded, "You'll just have to break one."

It was difficult to find suitable material for models in scale to imitate the prototype material. In the first models I used wire and hot glue to understand the angles of the connecting pieces. Then, I 3D printed the joints to make the intended prototype while also having the possibility to use the joints with segments in different configurations. Flexibility and interchangeability of the joints became essential to my system as a means to mediate happenstance and the unexpected.

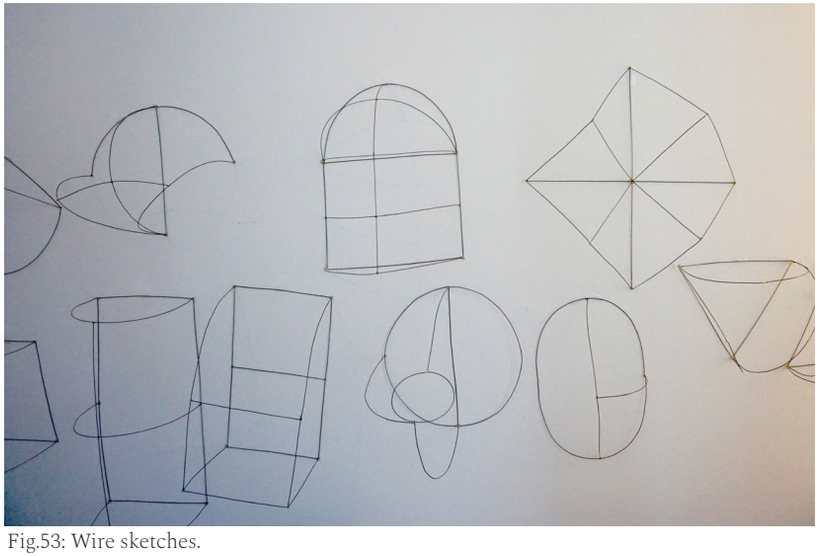
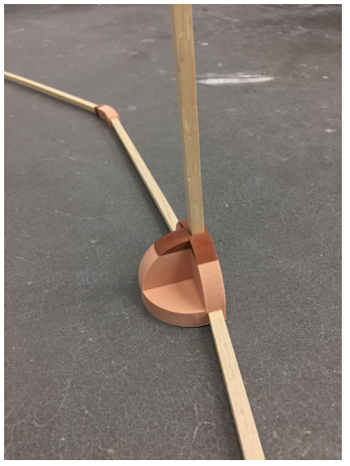
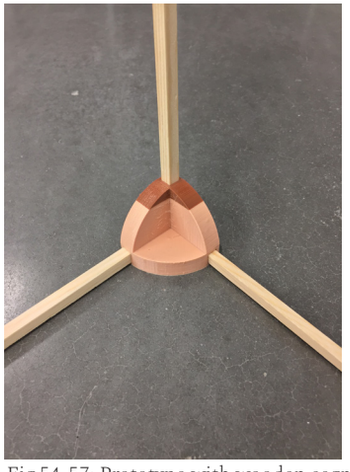


Fig.53: Wire sketches.





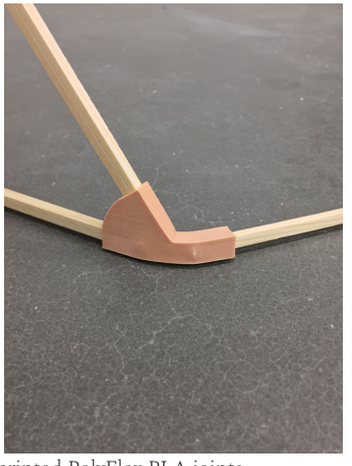


Fig.54-57: Prototype with wooden segments and 3D printed PolyFlex PLA joints.

The first prototypes utilized thin, rigid, squared-off wooden segments with flexible 3D printed PLA joints. The rubber-like flexible PLA could accommodate the variable thickness of the wood and the flexibility of the joint created friction to keep the pieces in place. For these first prototypes, I worked between drawing, wire model, and the Rhino 3D modeling program to make perfect angles and segment intersections. I was playing with sticks in a calculated manner and figuring out how to make 3D printed PLA polyflex into a flexible and rigid unit while first using this very light weight material.

From this practice with complex 3D printed joints, the problem became to make a stable rounded form from the least amount of rigid segments. I wanted the structure to have a kind of ease and logic for the user in the end, not feel like a challenging child's toy. I made progress with a standing structure which was barely weight bearing.

With the help of my advisors, glass fiber battens and bamboo came into my rabbit-holed vision. I was searching for an ideal composite material while developing a system of modularity for segments. Battens came on my radar as this device used horizontally in sails to keep them rigid. The glass fiber batten was extremely flexible, strong and bent easily in one direction, because of its flat profile. With the battens I could make curved prototype structures with less pieces that would utilize tension to bear the compression of textile weight.

The glass fiber battens are an entire world in themselves, but remained too flexible and could only hold the lightest textile. The glass fiber batten is also hazardous to handle, giving glass splinters, not environmentally friendly, as they are basically glass fibers bonded with glue, and too expensive to lend themselves to free experimentation in a conceptual design context.

At this point in my process I had lost sight of my concept in terms of accessibility of construction as key and the essence of the wooden sailboat materiality. This is when bamboo serendipitously came into the picture as flexible, strong and sustainable. Bamboo is a kind of hybrid material that can be treated like wood but can also act like a synthetic, like glass fiber. Which when pushed to extremes, bamboo revealed it can break in both ways, split at a weak point and snap unexpectedly under pressure.

The 3D printed joints were too slow and limiting for the speed at which I wanted to play with formations and make new attachments. I also started to question the importance of such a specific piece of the structure that could only be made by a small percentage of the population with access to a special 3D printer and the creation of another plastic component in the world. If one essential connector was lost, another one would need to be printed.

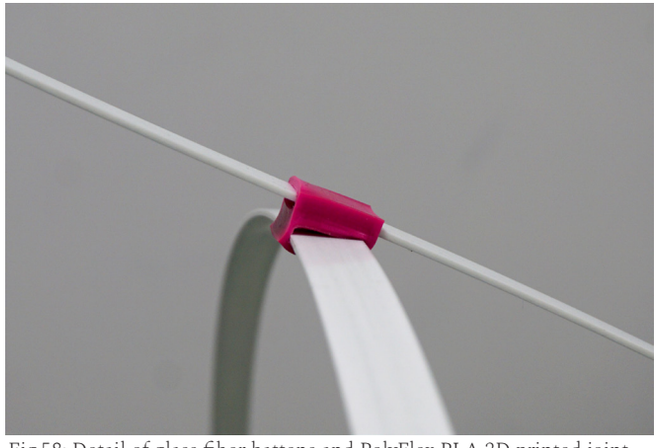


Fig.58: Detail of glass fiber battens and PolyFlex PLA 3D printed joint.

Fig.59: Glass fiber battens and PolyFlex PLA 3D printed joints.

Fig.60–63: Trials with glass fiber battens and PolyFlex PLA 3D printed joints.

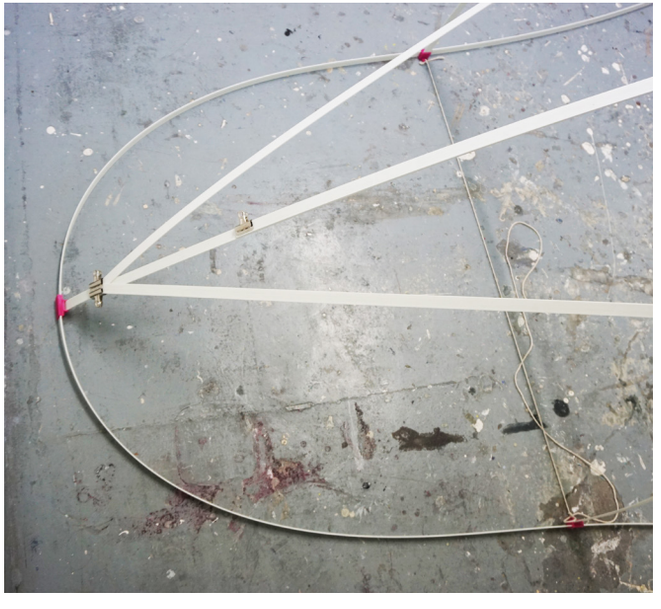


Fig.64–67: Trials and prototypes with bamboo and hardware connections; early dumpling prototype takes shape and can change shape to fit into narrow spaces, like elevators.

Fig.68–69: Trials connecting bamboo pieces into a spiral at the top of the dumpling prototype.

Fig.70–71: Early dumpling prototype made of bamboo pieces and hardware. The difference of proportions made the structure top-heavy and created an instability. Here Carlos demonstrates the resulting dancing motion controllable by strings attached at the top.

Fig.72: Bamboo segments and PolyFlex PLA 3D printed joints in large dumpling prototype.

I decided to drill standard, temporary attachment holes in each uniform length, at each end and in the middle. Each segment was roughly the same, with a couple millimeters of variation in any given dimension. I soon learned that each end would need two vertically drilled holes at the ends to keep two segments connected with nuts and bolts from folding at the joint when bent, such as when trying to create a full circle.

From this free structural play with the bamboo lengths, I started to establish a method and language of how the pieces could be constructed to stand and create a volume. It became tiresome to make full-scale mistakes, but I could not have learned the exact physical effects of my trials otherwise. Pye states in *The Nature of Design*, "The two commonest sources of chance discovery or invention are play and error" (Pye, 1967, p. 69). From play, error and small victories in scale I have acquired knowledge for creating flexible modular structures. The models I made served as starting reference points but could not predict the reaction of the material. Identifying myself as a maker, this reinforced my skills of material-based problem solving as a means of form-finding and discovery.

I constantly considered the inside feeling of the volume and how a textile would be supported. The resulting forms took on a sculptural quality of composition and material. Once I found several structures that worked with bamboo, nuts, and bolts, I chose one to push further and for which to develop printed joints. The form I liked the most was most accidental and was a spiral developed from repeated, linking arcs. It formed a round, domed space like a half-sphere or dumpling. I pushed the first prototype to its maximum size, now that I had found a sturdy, springy structure and I was attracted to the geometry, movement and scalability of the form.

3.3

Coming Full Circle

The initial textile I used in the hull-cabinet was nylon ripstop, a technical fabric used in sports gear because it is lightweight, durable and non-absorbent. The same textile is used in spinnakers, an extra light weight sail used for racing in the front of sailboats. In my research to locate battens, I came across a local sailmaker with an old enormous spinnaker. Having this excess of material, a sound structural system and method of creating specific joinery, I executed the dumpling-shaped monstrosity of a space which could hold about ten adults. Only later, did it become apparent that I had become lost in the challenge of scale and my strange 3D printed joint

system. The dumpling-tent had become far too large, requiring a circle of sail nine meters wide to cover thirty three bamboo lengths.

The prototype was challenged by an advisor and I was pushed further to use a whole sail intact, rather than cutting a circle from a triangular sail and leaving the rest for waste. Sailors are essentially frugal and resourceful people, relying on what is provided by the weather, otherwise they would use a motorboat. It is not about how fast you get there, but how you get there. My partner's folkboat has a small spinnaker which is only ever used for racing. It came as happenstance that this unused, precious textile could be revived and repurposed in its entirety to cover a new bamboo structure.

The sail was borrowed for the use of the hull-tent, with a firm promise it would not be harmed or altered. After a short detour, the project came full circle. After searching for the ideal material to emulate the interior of the boat, I returned to wood and sail. The structure came to be a combination of former experiments with the sail informing the shape and size of the bamboo frame. It uses the least amount of material to make a comfortable space for standing and seating four to five adults. The enclosure is not meant to be for shelter within extreme environments, but as a personal and collective refuge. It frames a space and offers an opportunity for a specific experience, while the sail can then return to its intended purpose on the boat.

I did not continue with the 3D printed joint research, but it was valuable to challenge what can be done with flexible PLA material. I preferred using drilled holes with nuts and bolts to overlap and connect bamboo segments because anyone can buy the common metal hardware from the store. The system remains open and can be easily altered.

Through the framing of my concept as physical experience, I experimented with different means of creating an enclosure. These prototypes are speculative as they are outside of the realm of typical or practical furniture, yet open up a conversation for what is desired for novel experience. These are made with typical materials and by ordinary means, and look back to times of nomadic self-made shelters. But within a modern context, the structures suggest activity and social norms outside of our own. Opportunities are presented of self-created space to be used within existing structures or elsewhere in nature. They are everyday autonomous spaces, like a sailboat or tent, but which elicit a sense of refuge and seclusion without the event of adventure, such as with tents or boats. The hull-tent is a recreatable atmosphere for experience's sake.

What I had lost sight of in my process was feasibility and simplicity, as with sailing, anybody can make a dingy and catch some wind in a textile to achieve motion. In the end, the most basic elements were best suited for making the hull-tent also—sticks, generic hardware and found textile. In my research, I was most interested in that which highlighted some of the same sentiments as within the sailing community—inclusiveness, resourcefulness, conservation of material, and a collaboration with nature.

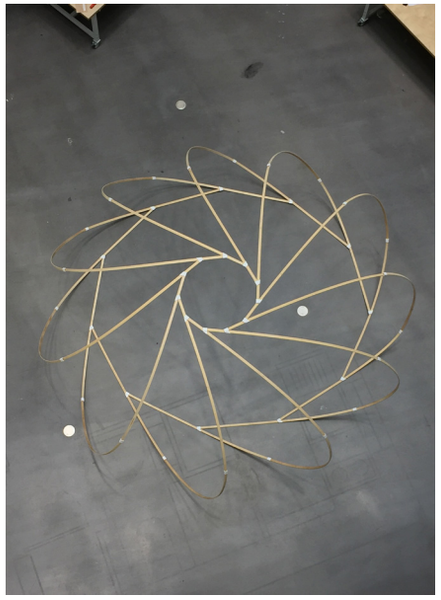


Fig.73-75: Dumpling prototype from above and side with uncut sail.

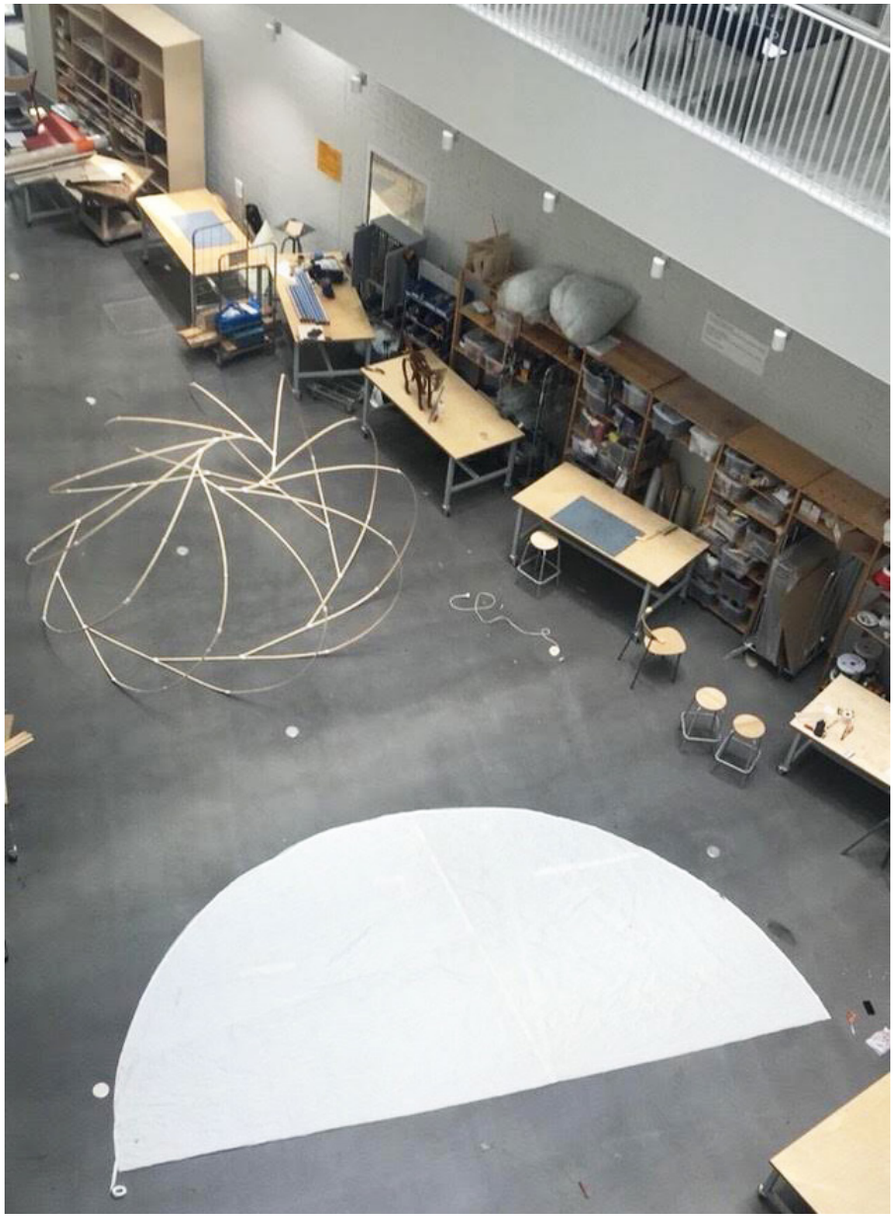


Fig.76: Dumpling prototype from above with sail cut and folded in half.

Fig.77: Whole large spinnaker sail in bag.

Fig.78: *Spring Wind House* by Architecture Uncomfortable Workshop.

Fig.79: Rauha cabin in the fall with its boom and sails.

3.4

Emotional Relevance

This project has been a means of challenging myself as to the conceptual nature of my work and larger dialectic scope of my interests, but has selfishly been a means of connecting with others. I have not set out to create a consumable product, but an experimental associative space inspired by the people I love which can be shared with others. We are all a product of our environment and community. I was initially inspired by my partner buying an old wooden sailboat and wanting to create something specifically for that space to celebrate its specificity and its endurance as a vessel. Upon initial research, I found that there is a database dedicated specifically to the wellbeing of wooden boats, that they are looked after as extinct creatures in case of neglect. They are representations of what cannot be consumed and discarded. A wooden boat can be cared for, mended, refurbished, rebuilt, but should not be destroyed. Rauha stands as the antithesis of our consumerist culture—a thing treated as a living entity.

I grew up by the sea admiring boats with parents that fostered a sense of pride in the hand-made and in quality of craftsmanship. My father is a carpenter and my mother works with garments, so it makes sense that I should make a structure of textile. One way in which objects take on meaning is by sharing them with another person. This can happen by different means—making or constructing them together, by using them with another, by making something inspired by another's needs or materials.

The hull-cabinet was made with my dad as a method of comfortably producing a prototype as an amateur. The experience of my father using the finished prototype gave me more practical knowledge of its function and it reestablished our relationship, me as a non-builder designer in the practical sense and him as the non-designer builder. It was an opportunity for us to collaborate on a project and to exchange otherwise hidden or obscured information about ourselves. Working with the textile throughout the project, my mother became a source of understanding and connection, the form of the textile foreign and strange, while the idea of draping and pattern making was familiar.

My partner became a constant connection to the essential ethos of sailing. As a new sailor, recent boat-owning-foreigner, he was accepted into his new community without question and received gracious support. His character melds as a self-determined, autodidactic, adventurous person. He is my window to an authentic and atypical sailor, taking pride in his vessel, figuring it out as he goes, and reveling every time in the moment he can turn off the motor and experience the swift silence of sailing.

4

R e s u l t s

I set up the tent in the school workshop, in a park, and on an island. The workshop environment gave me the space to negotiate the bamboo and the sail and to test the hull-tent in real time inside under fluorescent lights. Next, it was brought into the wild in a park on a summer night to have a picnic with friends. The light changed from sunset to dark and gave a spectrum of experience between light and spinnaker nylon that was white and red. The enclosure gave a sense of seclusion to the four of us and encouraged intimate conversation. People could be heard walking their dogs outside and headlights later passed across the outside. It was my first time sharing the process of building and breaking down the tent with others and what once seemed crazy, was accepted, approved and understood. Last, I set up the structure on an island, which we sailed to, creating a connection with the idea of the structure as mobile, sailboat inspired and constructed.

Fig.80: Hull-tent in use in the wild.

Fig.81: Hull-tent in Roineenpuisto in Helsinki, Finland with friends.

4.1

Set-up Response

The tent finally made it to an island. It felt like the beginning of Fall but you could still feel the warmth of the sun. I found a spot a bit more private from the shore. The sun was coming through the trees and the moss was so soft, cushioned and damp. I felt as though the weathered sailors were interested in my bamboo pieces and later contraption, but we were never interrupted, just met with curious looks. I can not speak Finnish well and I am not very good at managing the ropes to moor a boat, but I am enamored with Finnish sailing culture. The spinnaker of the Folkboat 170 is finding a new life in providing shelter; it gives cover, keeps in some warmth, and casts a pink glow on those curious to come inside. As a foreigner and practicing first-mate the tent is a means of own-ness, of exploration, of intimacy, of experimentation, of experience. In the end, it feels as though the process has been more important than my end result, the tent-structure does not feel like an end in the sense of it being a totally finished, polished product. Maybe that is the point, that it is still an object-structure with materials of potential that can still transform for other means.

I have restricted myself to having the least amount of effect on the materials of bamboo segments and sail. The sail is a sacred thing of personalized mobility and pride and could not be altered in any way. The bamboo has five holes each and still retains the strength and integrity to be utilized for another structure or purpose. The nuts and bolts are easy to find and handy to use as versatile connectors. I am a romantic designer; I like to think of myself as someone who not only imagines future scenarios but unlikely, idealistic, charming ones where our value systems have somehow been altered entirely. I have worked within the specificity of objects and experience and ritual, but have not challenged myself to incorporate this idea of conservation of material, to riff on Newton's Conservation of Mass. For me, this is the next frontier of design/making/living—to encourage the active user and maker, to think beyond conception to retirement, what is the next life, how can something be reused, how can the next reincarnation elevate and continue and improve?

The process of the hull-tent-structure has gone through several iterations from its first inspiration as a mobile structure inspired by sailing necessity. The initial concept grasped at ideals which became overpowered by clever design notions and aspirations of convenience or scale. Arriving at this point of breakdown structure and cover, I still feel inspired to continue pushing my ideas of what designerly ways of making can be to enhance our daily experiences of living and better align our ideals with our lifestyles. A large part of this synchronization is breaking from consumerist pressures and tendencies. Some facets of techno-material lives are nearly impossible to avoid. But what if we can enrich our material interactions to the extent of extending product life, evolving our possessions with our own changes and thinking ahead when we acquire things rather than finding the easiest fastest compromise/solution? Mixed trash/complex waste which glues and envelopes and renders materials non reusable—that is the most daunting. The more we can close the loop of use and reuse within our own small communities, the more we can enrich our experiences and connection with our possessions. It is a quiet fight against luxury aesthetics, what is acceptable and what is truly important. It is exercising some romanticism for our things, appreciation and connection to grow long-term relationships with material commitments to form healthier consumption habits, like regular exercise can become a healthy habit to exercise our bodies, so can repurposing, mending, reuse, and creative problem solving exercise our minds if challenged and tried.

Fig.82: Hull-tent pre-boarding Rauha in Vuosaari, Finland. Spinnaker sail in canvas bag and bamboo structure wrapped together.

Fig.83–84: Hull-tent bamboo frame naked and with spinnaker sail on Mölandet Island, Finland.

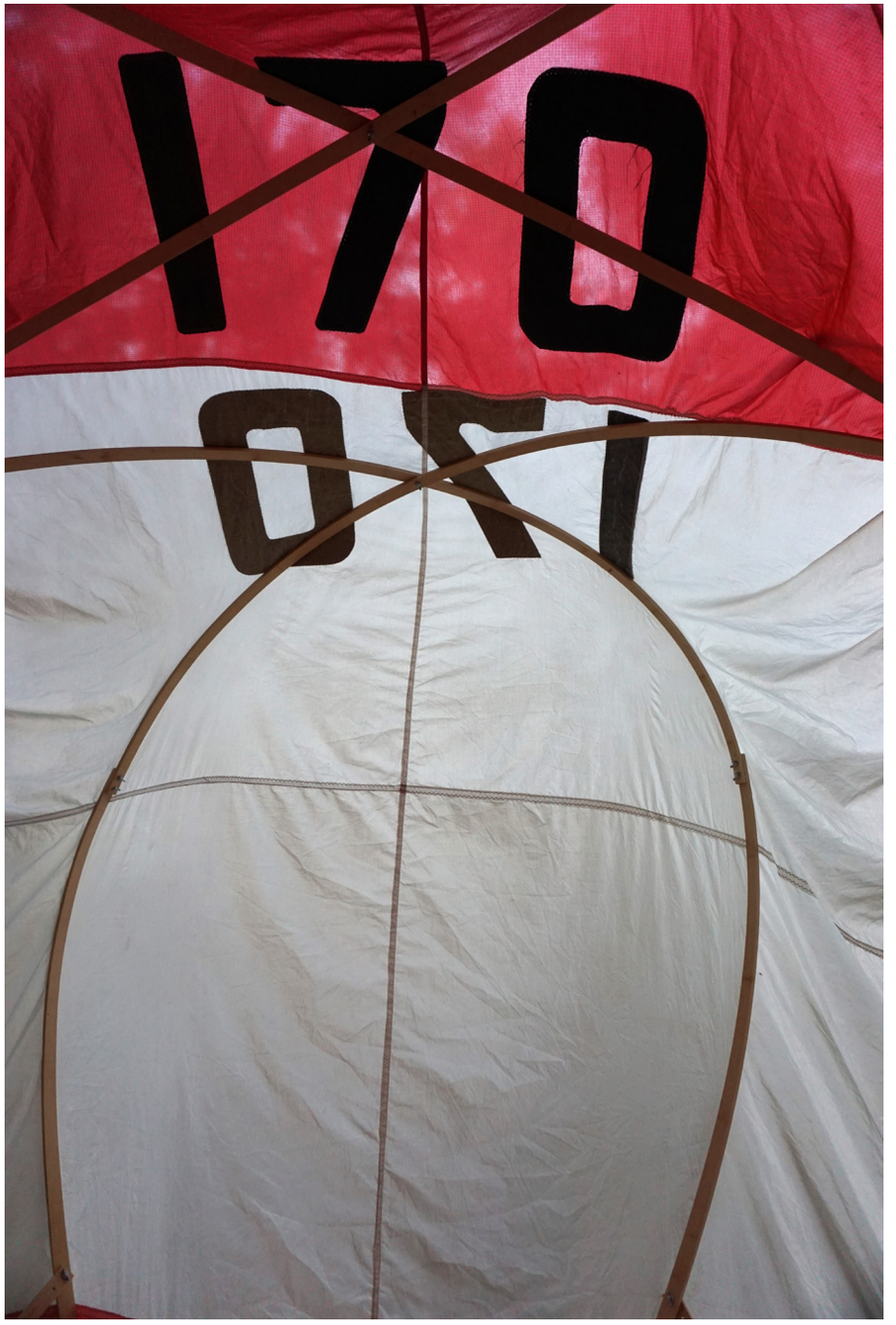


Fig.85–86: Hull-tent interior details.

4.2

Atmosphere of Space

All of the mechanisms and pieces of a boat are revealed at the surface, the signs of labor and wear are immediately noticeable and the sense of dwelling is uniquely apparent inside the cabin. The situational atmosphere of a sailboat contributes to an altogether foreign reality and pace of time. “Phenomenal reality is therefore the result of sensori-emotional experience, suggesting an ongoing dialogue between human beings and the entities that surround us” (Malnar & Vodvarka, 2004, p. 24).

The specific atmosphere of a space is also affected and is determined by conversation. In Ann Cline’s *A Hut of One’s Own* she describes building a hut and curating small intimate space as a place for solitude as well as company. Cline describes the tendency of people in a small space, “Human beings close together *have* to talk; we’re generally uncomfortable any other way” (1997, p. 36). While enabling personal exchange, Cline describes the atmosphere and the advantage of smaller inhabited structures:

> Within the inhabited hut, cultural issues and practices readily converge. With an agility larger structures can never match, huts bring together the physical environment with such disparate aspects of culture as necessity, fantasy, faith, and “life-style.” The hut, then may be humankind’s supreme experiment. (1996, p. 62)

Conversational exchange is how we figure out and communicate our values, ideas, and how we construct our identity as people. Essential to this study of human behavior within the hut, was that Cline built and continually modified her hut. Then she was able to intimately experience her own created space within nature and experiment with different lived and social forms for tailoring different experiences. To reference Thoreau again and his experiment of self-made living, “To affect the quality of the day, that is the highest of the arts. Every man is tasked to make his life, even in its details, worthy of the contemplation of his most elevated and critical hour” (1960, p. 65). With this sentiment, I highlight the importance of the role and obligation of the user to have a mindfulness of their environment via objects, materials, and daily functions.

Fig.87: Rauha cruising with sails down.

4.3

Progress in Failing

The structure has been successful in creating a meaningful aesthetic experience which is evocative of sailing. I struggled at first with the idea of my project becoming simpler with each new prototype iteration. In the end, I feel the concept has been distilled in the last structure and has reached a level of simplicity, honesty and ease akin to the core of sailing.

"The mere fact that I lack design talent was only, well, an interesting design constraint," recalls Sterling when asked to design a lamp as a science fiction writer (2005, p. 34). As a student trained as a ceramicist and as a tourist within different design materials and object types, *Hull of a Home* was a means for me to experiment outside of familiar design typology. This process was a learning opportunity in which I had the freedom to begin with a concept rather than a brief or direct problem to solve. The thesis served both as a way to piece together disparate knowledge, methods, and ideas from time studying while also experiencing a kind of honeymoon with my design curiosities and questions before graduating.

Consistent goals in my project while searching for a manifestation of my sailing-as-space-personified were to make a mobile, standalone, light-weight, enclosing structure for land. It was difficult to search in the dark for something which began as shapeless, but led in hindsight to valuable trials of experimentation in process. As Sterling says in *Shaping Things*, "The ability to make many small mistakes in a hurry is a vital accomplishment for any society that intends to be sustainable. It's not necessary that every experience be sensible, logical or even sane—but it's vitally important to register, catalog and data-mine the errors." (2005, p. 47–48).

It is important to remember in the midst of unexpected results and roadblocks, that work and effort is not in vain, but a part of larger, continuous research. All of the tests and prototypes are not included in this thesis as they diverge at times as irrelevant to the final project. Play with different materials and structures was integral as a means of realizing the requirements for achieving a life-scale structure and what details were essential. I have "data-mined the errors" as Sterling stresses, or learned from them, by having now having a unique knowledge of flexible structures, materials and joints, and a better awareness of when to compromise material choice for concept, and vice versa. Within my process, I have learned more about what I find important, valid, and fulfilling, beyond the surface of visual aesthetics. In the wake of these ideas, which at the time felt like errors, I have found more confidence and courage in play and the happenstance of decision making. As Bachelard notes in *The Poetics of Space*, "a psychology of the imagination must make note of everything, since the most minor interests can prepare the way for major ones" (1994, p. 121).

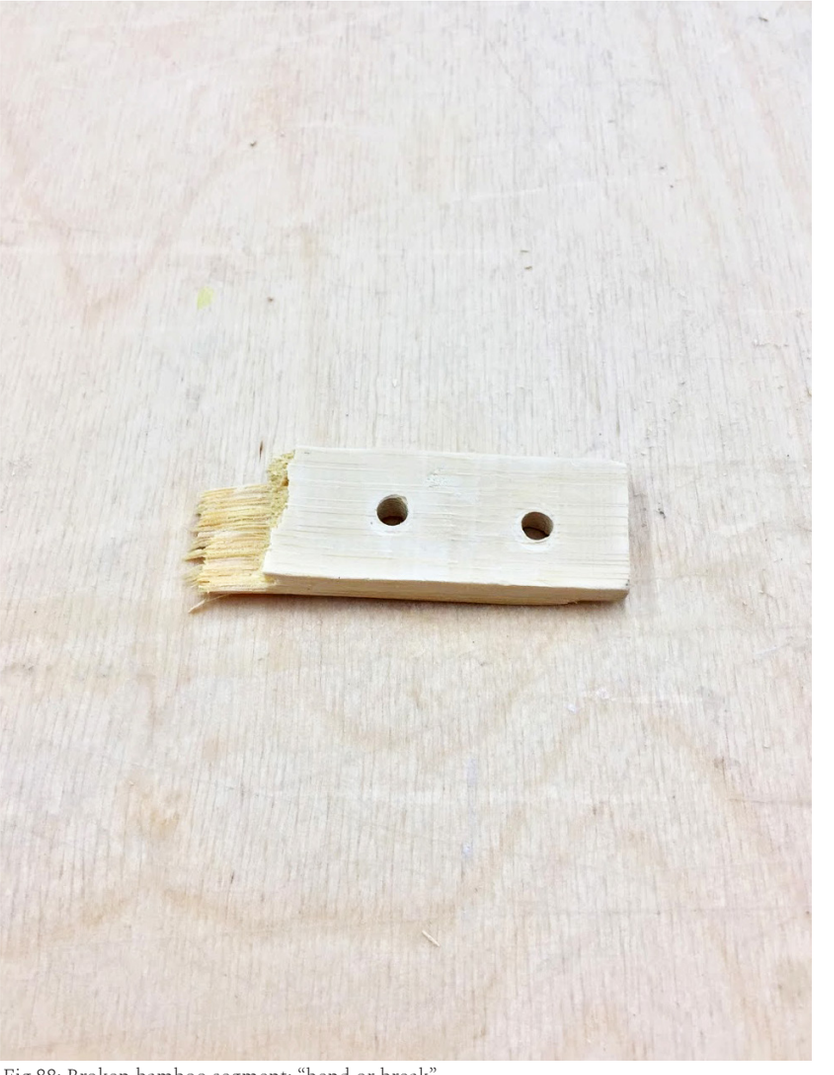


Fig.88: Broken bamboo segment; "bend or break".

4.4

A Stopping Point

This project has been a vehicle for me to explore design philosophies which I value and want to align with not only in idea but practice. Like most makers, I question what is important to make and if I can make any difference in the current state of socio-ecological global affairs. Gernot Böhme writes in *Atmospheric Architectures:*

> Capitalism in Western industrialized nations shows itself as an economy of waste. The production of aesthetic values—packaging, design, styling, of products that serve nothing but glamour and self-staging—is luxury production. It does not fulfill elementary needs but constantly stimulates a ravenousness for the intensification of life. (2017, p. 34)

Instead of producing a commodity with purely aestheticized value, I wanted to reconnect to the immediate experience of the senses. I have a growing distaste for fetishized design objects which speak largely of class status and recycled masculine modernity—tasteful, derivative, neutral, clinical things. Cline in *A Hut of One's Own* remarks, "In troubled times, they all sought to experience life away from social definitions of success or failure. From there, these primitive huts marked personal, original inquiries into the ever mysterious nature of human existence" (1997, p. 14). My hut does not hold signs of status value, does not participate in commercial exchange, and is an experiment in how design can be utilized outside of decorative novelties or technical solutions. Sailing as a leisure activity is a privilege for a select few, but utilizing an old sail or other textile is available to anyone with a scavenger's attitude. The interior space is an oasis apart from normal social constructs and expectations. Above all, it represents mediating risk versus certainty as a maker, as was introduced to me in my bachelor's ceramics course, Pye writes in *The Nature and Art of Workmanship*:

> If I must ascribe a meaning to the word craftsmanship, I shall say as a first approximation that it means simply workmanship using any kind of technique or apparatus, in which the quality of the result is not predetermined, but depends on the judgement, dexterity and care which the maker exercises as he works. The essential idea is that the quality of the result is continually at risk during the process of making; and so I shall call this kind of workmanship 'The workmanship of risk': an uncouth phrase, but at least descriptive. (1968, p. 20)

5

Conclusion

The thesis has been a valuable experience to question my working methods as a designer, my tendencies, essential interests and motivations. Through this project, my intention is to inspire different means of approaching process via concept and users' interaction with objects and materials. We learn by doing and gain knowledge by understanding.

I have recognized my domestic nature and the domestic nature of people as necessary for establishing identity and inhabiting a personal space. I question what possible environments and living situations might look like, daily habits and means of working and restfulness. As our living spaces become smaller, we hold a greater importance on those places which are reliably comfortable and available. We are creatures of habit who require privacy but also value community. As a person moving from place to place, I have a reluctance to acquire too much in case I need to move again. I have found what remains important is sustaining connection with people and an intimate perspective of what is essential for our own experience.

My life has taken on a feeling of impermanence which can be reflected in the project, as something that is changeable and movable, yet retains comforting elements of significance. My home is sailing, the sail is my partner, the draped textile is my mother and the bamboo and hardware is my father. I have quite literally designed a hiding place, a fort or nest, to be surrounded by support and nostalgia. This layered significance serves as justification for my spatial exploration and background for the importance of making place of space.

"My body is like a drifting cloud—I ask for nothing, I want nothing. My greatest joy is a quiet nap; my only desire for this life is to see the beauties of the seasons" (Chōmei, 1955, p. 211).

6

References

Fig.89: Make-shift open-air Florida workshop.

6.1

Images

All images by the author unless specified.

Fig.17: https://travel.wikinut.com/img/1yexl88awulnx547/A-Fisherman-carrying-a-Coracle.
Fig.18: Photograph by Sir Claude MacDonald, *Memories of Japan* by Ethel Howard, 1918. https://archive.org/details/japanesememories00howarich/.
Fig.19: https://www.design4disaster.org/2011/02/12/mella-jaarsma/.
Fig.23: Photograph by Frank Bayh and Steff Rosenberger Ochs. https://www.designboom.com/art/tent-city-at-stuttgart-21-by-frank-bayh-steff-rosenberger-ochs/.
Fig.27: Photograph by Jason Lee Starin, *BetterThanSculpture* Instagram account. https://www.instagram.com/p/Bf9ExntHp5O/.
Fig.28: Photograph courtesy of Nur Horsanalı.
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Fig.30: Photograph by Mikko Aspinen.
Fig.33: https://walkerart.org/magazine/enter-matrix-interview-ken-isaacs#_edn1.
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Fig.36: Photograph by Hipfel/Starck. https://www.naturetravels.co.uk/gallery/gallery-vv58rs1.htm.
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Fig.43: Photograph from *How to Build Your Own Living Structures*. Harmony Books, 1974. https://hippliplans.tumblr.com/post/102542325184/super-chair-by-ken-isaacs-from-how-to-build-your
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Fig.51: Photograph by Wolfgang Volz. https://christojeanneclaude.net/projects/big-air-package.
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Fig.78: http://auworkshop.com/au-m-au-w/.

6.2

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7

Appendix

The appendix is intended to include information of which the reader might still be curious or interested. This includes: sailor interview questions and portraits of the sailors I met in person, the specs (specifications) of the hull-tent prototype, and a selection of images from my thesis notebook pages (lokikirja). I have not included these materials in the main body of the thesis text for consistency in the writing and for the sake of focus and brevity.

7.1

Interview Questions

Depending on the nature of the interaction, I either sent the list directly or tried to weave the questions into our conversation naturally.

1. How did you begin sailing?
2. What is your most valued tool?
3. What novel/unnecessary items do you like to have on-board?
4. What do you usually eat on-board?
5. What are your sleeping conditions like?
6. What do you wish your boat had that it is lacking?
7. What do you find most challenging about being on a boat for a long time?
8. What do you find is easier at sea and on-board than at home on-land?

Fig.90: Jyrki with his self-made boat Kuikka in Rastila, Helsinki.

Fig.91: Tuuli with her shared boat Uhuru in Eira, Helsinki.

7.2

Hull-tent Specs

The hull-tent is comprised of 16 full lengths of bamboo and 4 smaller support pieces. There is one full circle of four pieces at the base of the structure which supports four arcs of three segments each. Each arc overlaps another at each joint of the circle. Two arcs are connected on each side overlapping at the top and opposite ones at the bottom. The support pieces are connected from the arcs connected at the top to middle holes in the base circle. The whole structure can be assembled in 25 minutes with 36 nuts and bolts. The remaining structure is flexible but durable and relies on the tension of the bamboo as it is bent and twist in a complex curve. This is one successful variation of a structure of this scale for the intended purpose and feeling. The space becomes enclosed but with vertical space of two meters and naturally created openings on either side from the triangular shape of the sail. The simple system of nuts and bolts allows the potential of the user to play with making alternate variations and structures for other potential textiles or circumstances. I like to think that the structural system is basic enough to be open-ended and accessible and to serve as a starting point for another person with similar aspirations of migratory space.

Fig.92: Bamboo and hardware of the hull-tent.

7.3

Lokikirja

In Finnish "lokikirja" refers to a boat's logbook. I affectionately titled my thesis notebook *Lokikirja*. The following are selected pages of relevant sketches and thoughts.

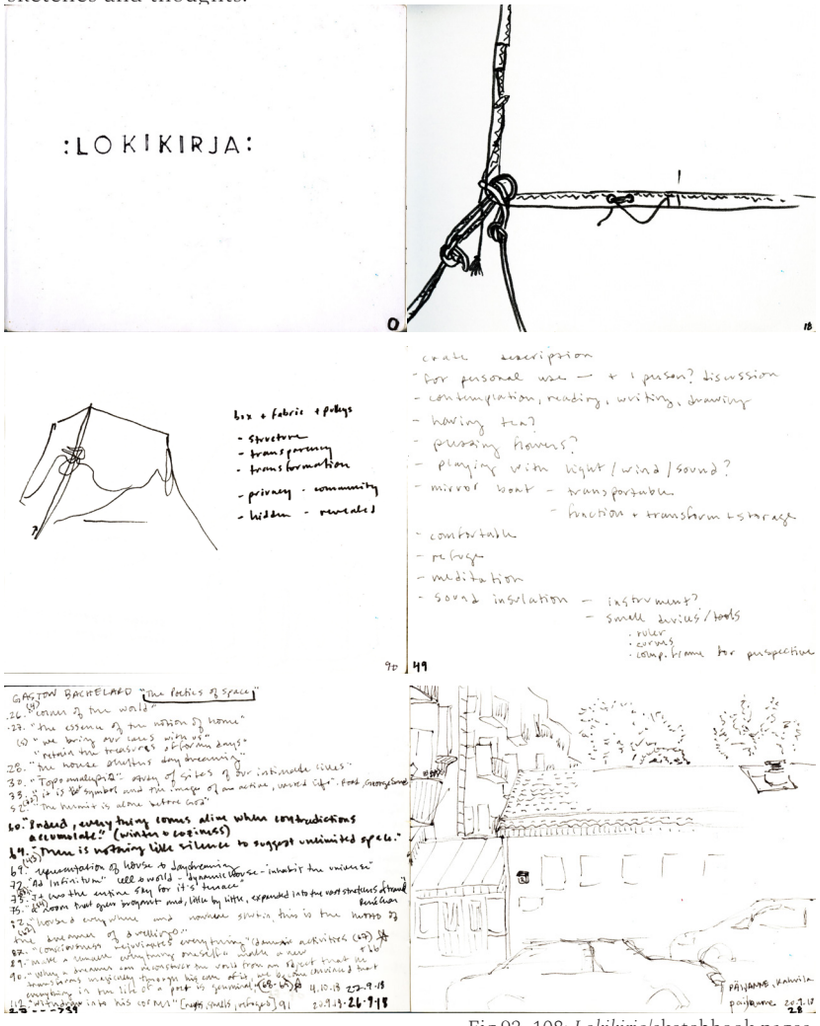
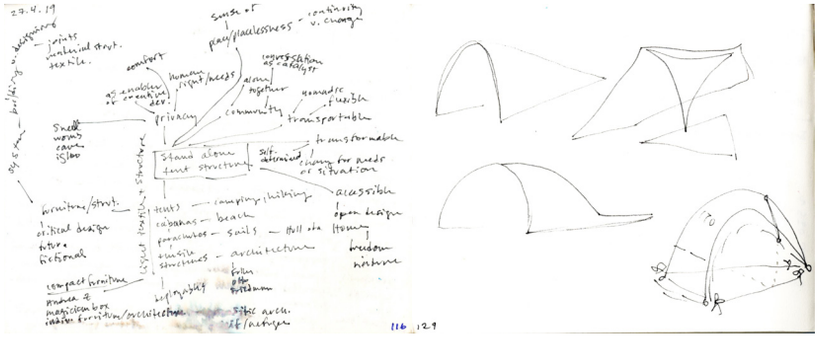
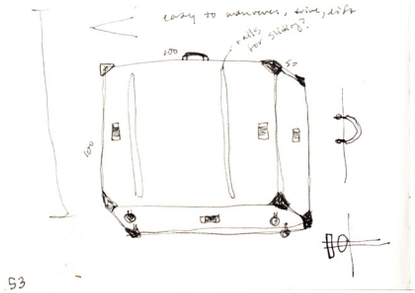
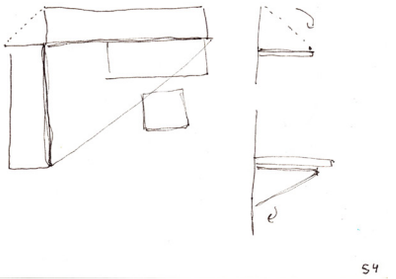


Fig.93–108: *Lokikirja*/sketchbook pages.

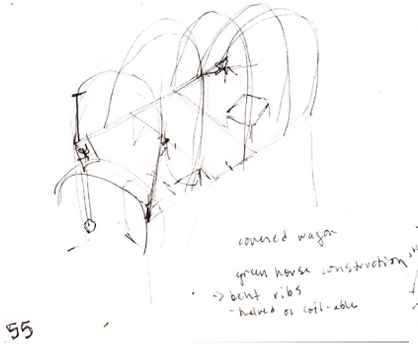

29.4.19
structure
joints
material strut.
textile.
comfort
sense of
place/placelessness - continuity
v. change
humans
privacy
community
transportable
Small
warm
cosy
igloo
Stand alone
tent structure
self
determined
transformable
changing for needs
or situation
accessible
open design
freedom
furniture/struct.
critical design
future
fictional
compact/furniture
transformable
magic/clever box
tents
cabanas - beach
parachutes - sails - thrill sta
elastic
structures - architecture
balloons
kites
paper
lightweight
Fiber arch.
EE/origami
116
129


easy to manoeuvre, drive, drift
walls for sitting?
100
50
100

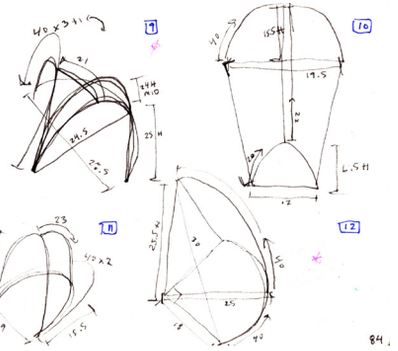
53

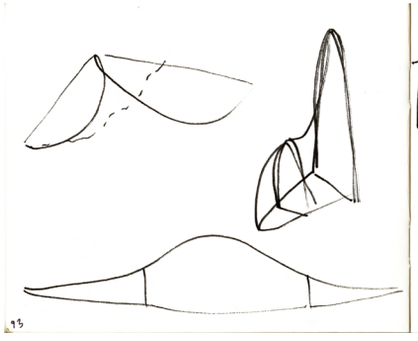


54

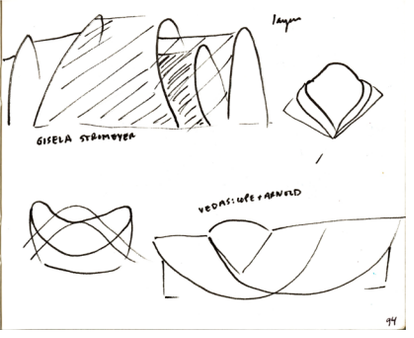

covered wagon
green house construction
-> bent ribs
- heated or cold - able

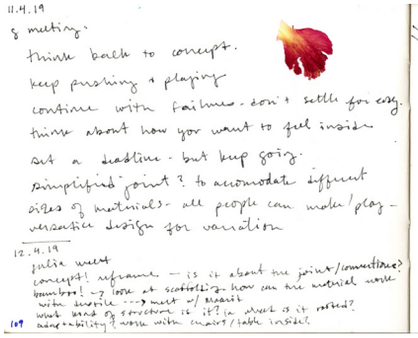
55


40 x 3 = 120
9
10
11
12
155 H
19.5
22
25 H
M10
24 H
29.5
27.5
40 x 2
23
15.5
25.5 H
35
84



93


GISELA STROMBYER
VEDAS: UFE + ARNELD
94


11.4.19
& melting.
think back to concept.
keep prooting + playing
continue with fairness - don't settle for easy
think about how you want to feel inside
set a deadline - but keep going.
simplified joint ? to accomodate different
sizes of materials - all people can make/play -
versatile design for variation
12.4.19
Julie meet
concept! reframe — is it about the joint/connections?
bamboo! -> look at scaffolding - how can the material work
with textile ---> meet w/ Anaïs
what kind of structure is it? is it worked?
easy + stability? work with chairs / table inside!
109

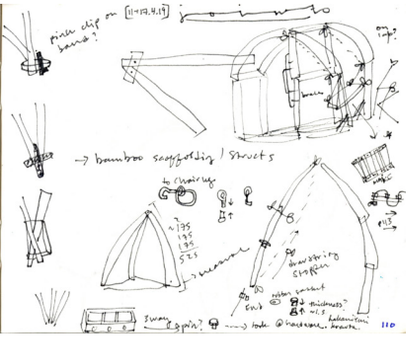
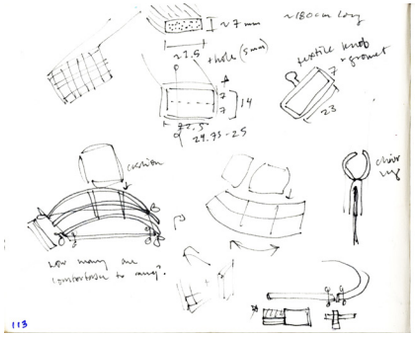
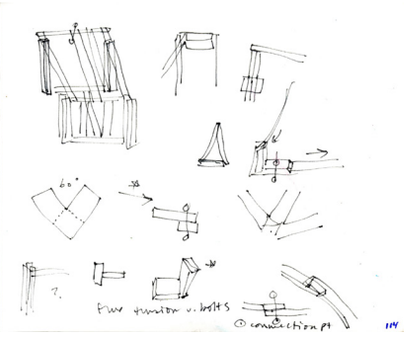
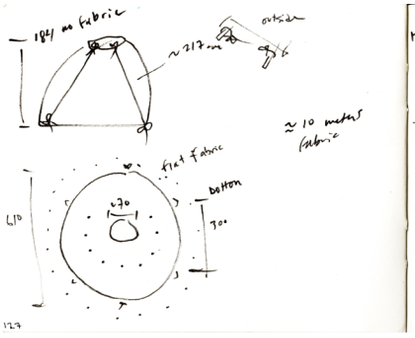
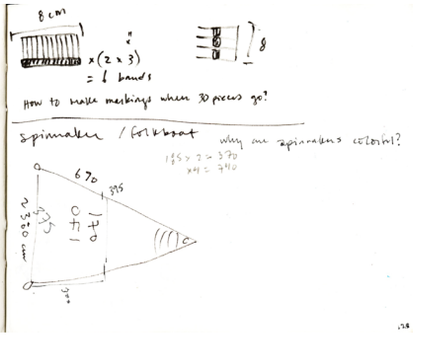


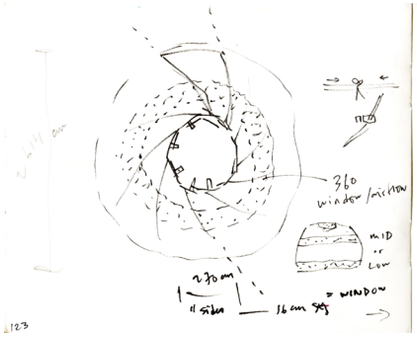
photo clip on [11+12.4.19]
bands?
-> bamboo scaffolding / structs
to chair up
~175
135
95
525
~ 1 m wide
Sway & spin? ---> look @ Fairground, theatre
110

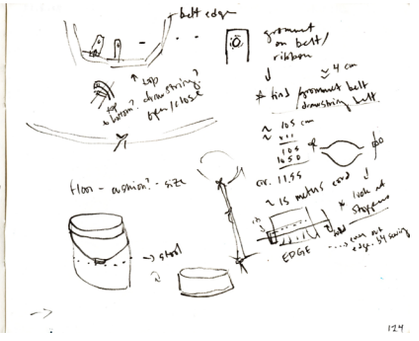

~7 mm
~180cm long
~7.5
thickness (5mm)
textile knob + grommet
14
23
27.5
27.95 - 25
cushion
obtain long
how many on 1 construction to many?
115

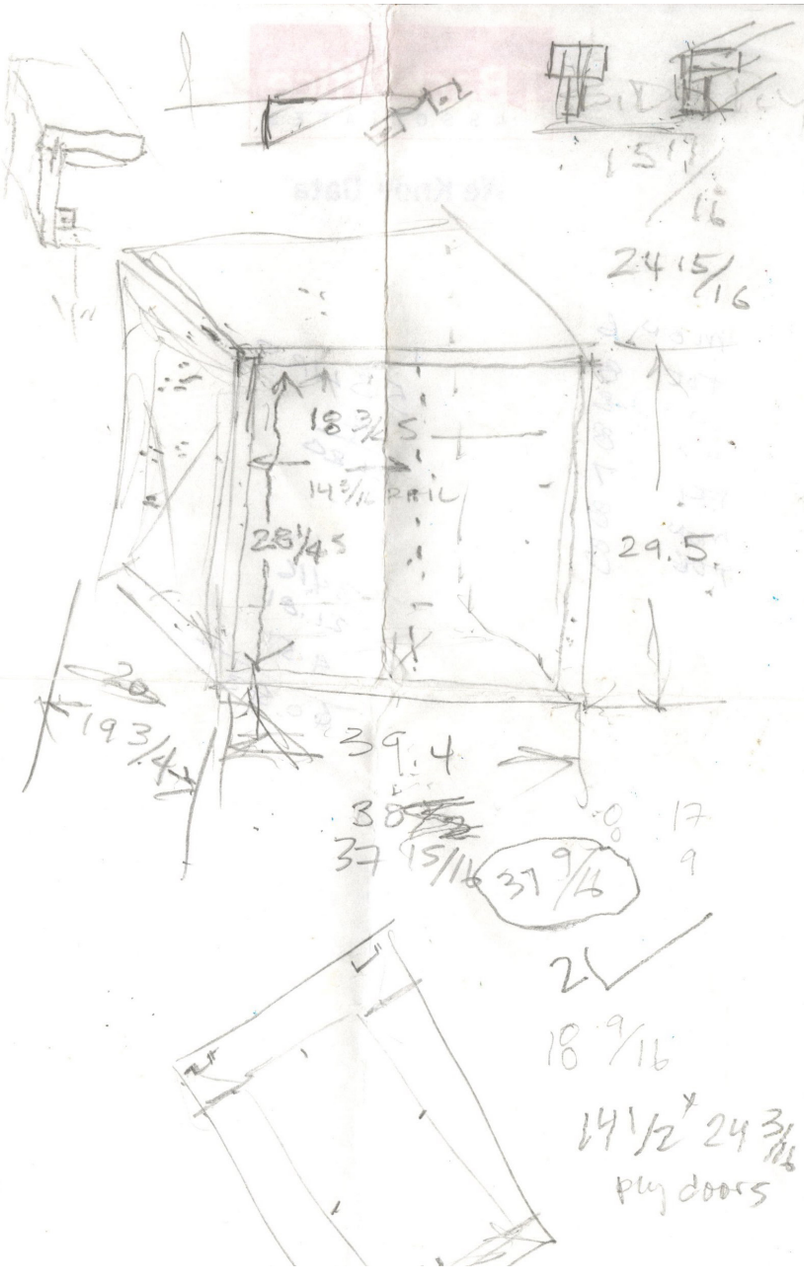

60°
35
four tension v. bolts
① connection pt
114


light no fabric
~217 cm
outside
≈ 10 meters fabric
flat fabric
610
~30
button
70
129


8 cm
x (2 x 3)
= 6 bands
How to make markings when 3D pieces go?
spinnaker / foldboat
why are spinnakers colorful?
145 x 2 = 370
x4 = 740
670
395
~500 mm
128


360
window / friction
MID
or
LOW
230 cm
4 sides
16 cm seg
= WINDOW
123


belt edge
grommet on belt/ ribbon
~4 cm
* has grommet belt drawstring belt
~105 cm
cir. 115
2.15 meters cord
* tack at stopper
EDGE
floor - cushion? - size
-> steel
124



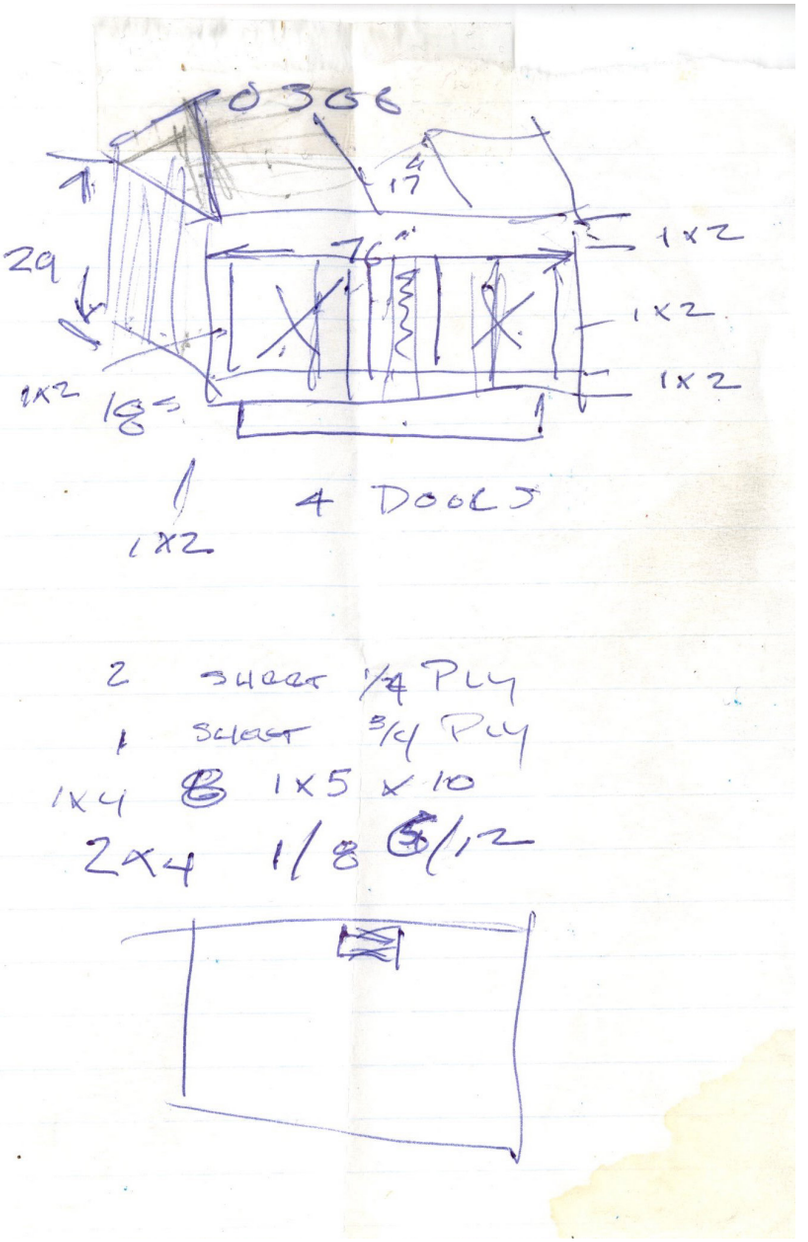


Fig 109–110: My father's sketches for the hull-cabinet.

Fig.111: Hull-cabinet perspective view in Florida.